

ADDENDUM TO

SEMI-ANNUAL MONITORING REPORT JULY - DECEMBER 2016

for the

Delaware Sand & Gravel Superfund Site New Castle, Delaware

Submitted To: United States Environmental Protection Agency

Region III

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April 2017 Project No.: 013-6052-012

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ACRONYMS AND ABBREVIATIONS

Army Creek Landfill ACL Artesian Water Company **AWC** Contract Laboratory Program CLP

Drum Disposal Area DDA

DNREC State of Delaware Department of Natural Resources and Environmental Control

DQA **Data Quality Assessment** DS&G Delaware Sand & Gravel

FSWP Rev 2 Feasibility Study Work Plan - Revision 2

Health Advisory HA

High-Density Polyethylene **HDPE**

Liquid Chromatography/Tandem Mass Spectrometry LC/MS/MS

Laboratory Control Sample LCS Low-Density Polyethylene **LDPE**

Laboratory Information Management System LIMS

Matrix Spike/Matrix Spike Duplicate MS/MSD

New Castle County NCC

NFG National Functional Guidelines

nanograms per liter ng/l

Perfluorinated Compounds **PFCs**

Perfluorinated Compounds Work Plan **PFCWP**

PFOA Perfluorooctanoic Acid

PFOS Perfluorooctane Sulfonic Acid

parts per trillion ppt

QA/QC Quality Assurance/Quality Control Sampling and Analysis Plan SAP Upper Potomac Aquifer UPA

Upper Potomac Confining Unit Transition Zone **UPCUTZ** United States Environmental Protection Agency USEPA



April 2017

1.0 INTRODUCTION

On behalf of the Delaware Sand & Gravel (DS&G) Remedial Trust (the Trust), Golder Associates Inc. (Golder) is providing this Addendum to the July-December 2016 Semi-Annual Monitoring Report for the Delaware Sand & Gravel Superfund Site (the Site) located in New Castle, Delaware (see Figures 1 and 2). This addendum summarizes the collection of samples from a subset of wells (see Table 1 and Figures 3 and 4) during the September-October 2016 monitoring event for analysis of perfluorinated compounds (PFCs). The samples were collected and analyzed in accordance with the United States Environmental Protection Agency (USEPA)-approved¹ work plan for sampling and analysis of PFCs in groundwater at the Site (PFCWP) dated September 21, 2016 (Golder, 2016a), and the Feasibility Study Work Plan Revision 2 (FSWP Rev 2) Sampling and Analysis Plan (SAP) dated October 21, 2011 (Golder, 2011).

¹ The USEPA provided approval of the work plan via email dated September 23, 2016 (USEPA, 2016a).



2.0 GROUNDWATER SAMPLING AND ANALYSES

Consistent with the PFCWP (Golder, 2016a) and the FSWP Rev 2 SAP (Golder, 2011), Golder measured water levels, purged and sampled select wells (see well list in Table 1) screened in the Upper Potomac Confining Unit Transition Zone (UPCUTZ) and in the upper and/or lower sand of the Upper Potomac Aquifer (UPA) at and downgradient of the Site (see Figures 3 and 4), and submitted the samples for analysis.

The following summarizes information related to sampling and analysis of PFCs in groundwater at the Site that was not provided in the Semi-Annual Monitoring Report for July-December 2016.

2.1 Sampling and Analysis

2.1.1 Well Purging

The monitoring wells were purged following the low-flow purging and sampling procedure² using a decontaminated 2-inch diameter submersible pump (Grundfos[®] Rediflo2) and low-density polyethylene tubing^{3,4} (LDPE) that was dedicated to each well, with the exception of well MW-18 which was sampled using a peristaltic pump equipped with LDPE tubing^{3,4}.

2.1.2 Sample Collection and Analysis

For analysis of PFCs, Eurofins Lancaster Laboratories of Lancaster, Pennsylvania (Eurofins) supplied certified-clean sample bottles, blank bottle labels, custody seals, analyte-free water, coolers, and chain-of-custody documents for the monitoring event. All samples were collected directly into the laboratory-supplied HDPE containers. Once the containers were sealed, they were placed into individual new Ziploc® storage bags, and carefully packed into standard sample coolers with ice at approximately four degrees Celsius. All samples were shipped under chain-of-custody procedures via an overnight courier to Eurofins for analysis.

In addition to the primary samples, the following quality assurance/quality control (QA/QC) samples were collected during the September-October 2016 monitoring event for PFC analysis:

- Eleven trip blanks (one per day of sample collection)
- Eleven field blanks (one per day of sample collection)
- Four field equipment rinsate blanks from decontaminated submersible pumps (one for each pump used in the field)

⁴ Due to concerns with use of LDPE tubing for sampling of PFCs, the LDPE tubing was swapped out for high-density polyethylene (HDPE) tubing for the April 2017 groundwater monitoring event.



² The procedure is based upon the USEPA Region II document entitled "Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling" dated March 20, 1998.

³ Prior to the September-October 2016 monitoring event, Teflon®-lined polyethylene tubing was used. Use of Teflon®-lined tubing and bailers has been discontinued at the Site due to inclusion of PFCs as analytes for groundwater.

- Field duplicate parameter sets from four wells (UPA-03D, AWC-E1, MW-29, and DGC-5) (one set for each set of 20 samples collected)
- Triple volumes from four wells (MW-26N, MW-31, DDA-07, and AWC-E2) for the analysis of matrix spike/matrix spike duplicates (MS/MSD) (one set for each set of 20 samples collected)

Samples were analyzed for fourteen PFCs by Eurofins using USEPA Method 537, *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1* (September 2009).

2.2 Data Quality Assessment

Eurofins logged the samples into their laboratory information management systems (LIMS) upon receipt, and scheduled the samples for preparation and analysis. Golder performed validation on all the data following guidelines provided by USEPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (September 2016), as applicable to the aforementioned analytical method. Additional information regarding sample analysis and validation, including the Data Quality Assessment (DQA) are presented in Appendix A. The laboratory result forms for the validated sample data are also included in Appendix A.

Based on the data evaluations and data quality assessment, the analytical data for samples collected at the Site were determined to be acceptable (including estimated data) for their intended use. All sample results in sample data group (SDG) DSG02 were qualified as estimated (J/UJ) when, due to laboratory error, samples were extracted outside the 14-day hold time. A corrective action letter from the lab regarding the samples analyzed out of hold time is included in Appendix A. Generally acceptable levels of accuracy and precision, based on laboratory control sample (LCS), MS/MSD, field duplicate, and surrogate recoveries, were achieved for the data. In addition, the data completeness (i.e., the ratio of the amount of valid data obtained to the amount expected, including estimated data (J/J+/J-/UJ)) was 100%. The data qualifier summary is presented in Table 2 of Appendix A.

PFCs were not detected in the trip, field or equipment blanks collected and analyzed during this event.

2.3 Analytical Results

The detected PFCs and their respective concentrations for the groundwater samples collected during the September-October 2016 monitoring event are summarized and compared to the May 19, 2016 USEPA health advisory (HA) of 70 nanograms per liter (ng/l; parts per trillion [ppt]) for perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), and/or the combined concentrations of PFOA and PFOS in Table 2.



2.3.1 Drum Disposal Area (DDA) Vicinity Wells

Golder collected groundwater samples from a total of 16 monitoring wells (2 wells screened in the UPCUTZ and 14 wells screened in the UPA) in the vicinity of the DDA for analysis of PFCs during the September-October 2016 monitoring event. PFOA was detected in UPCUTZ and UPA upper sand monitoring wells above the May 19, 2016 USEPA HA (see Table 2 for details). An isoconcentration map for PFOA in the UPA upper sand groundwater between the DDA and well PW-1(U) is included as Figure 5.

2.3.2 Wells Downgradient of the DS&G and ACL Sites

Golder collected groundwater samples from one UPCUTZ and 28 UPA monitoring wells located downgradient of the DS&G and Army Creek Landfill (ACL) Sites for analysis of PFCs during the September-October 2016 monitoring event. PFOA and PFOS were detected in downgradient UPA monitoring wells above the May 19, 2016 USEPA HA (see Table 2). PFOA concentrations in the UPA upper and lower sand downgradient of the DS&G and ACL Sites are shown on Figures 6 and 7.



3.0 RECOMMENDATION

As recommended to the USEPA via email on March 28, 2017 (DS&G, 2017) and approved by the USEPA on March 28, 2017 (USEPA, 2017), Golder will be performing a confirmatory round of PFC sampling and analysis during the April 2017 semi-annual monitoring event. The confirmatory round will include the same wells and PFC analytes as the October 2016 monitoring event. Based on the results from both the October 2016 and April 2017 PFC monitoring events, Golder will recommend a PFC monitoring program for the October 2017 monitoring event and incorporate PFC data into the conceptual site model.



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hera a. Miller

4.0 CLOSING

Golder appreciates the opportunity to prepare this report for submission to the USEPA on behalf of the Trust. Should you have any questions regarding this report, please contact Ms. Theresa Miller at (603) 668-0880.

GOLDER ASSOCIATES INC.

Theresa A. Miller, P.G., LSP Senior Consultant Ross W. Bennett, PE Senior Engineer **April 2017**

Project No.: 013-6052-012

5.0 REFERENCES

- Golder, 2011. Feasibility Study Work Plan, Revision 2, Delaware Sand & Gravel Superfund Site, New Castle, Delaware. October 21, 2011.
- Golder, 2016a. Perfluorinated Compounds Well Purging, Groundwater Sampling and Analysis Program, Delaware Sand & Gravel Superfund Site, New Castle, Delaware. September 21, 2016.
- DS&G, 2016. Email from Doug Sutton, on behalf of the DS&G Trust, to Debbie Rossi (USEPA) confirming quantification of both the linear and branched isomers of analytes in PFC Work Plan. September 30, 2016.
- DS&G, 2017. Email from Doug Sutton, on behalf of the DS&G Trust, to Debbie Rossi (USEPA) recommending confirmatory monitoring event for PFCs in April 2017. March 28, 2017.
- USEPA, 1995. Innovative Approaches for Validation of Organic and Inorganic Data Standard Operating Procedures. USEPA Region III. June 30, 1995.
- USEPA, 2016a. Email from Debbie Rossi (USEPA) to Doug Sutton (DS&G Trust) providing approval of the PFC Work Plan. September 23, 2016.
- USEPA, 2016b. Email from Debbie Rossi (USEPA) to Doug Sutton (DS&G Trust) requesting quantification of both the linear and branched isomers of analytes in PFC Work Plan. September 27, 2016.
- USEPA, 2017. Email from Debbie Rossi (USEPA) to Doug Sutton agreeing to recommendation for confirmatory monitoring event for PFCs in April 2017. March 28, 2017.



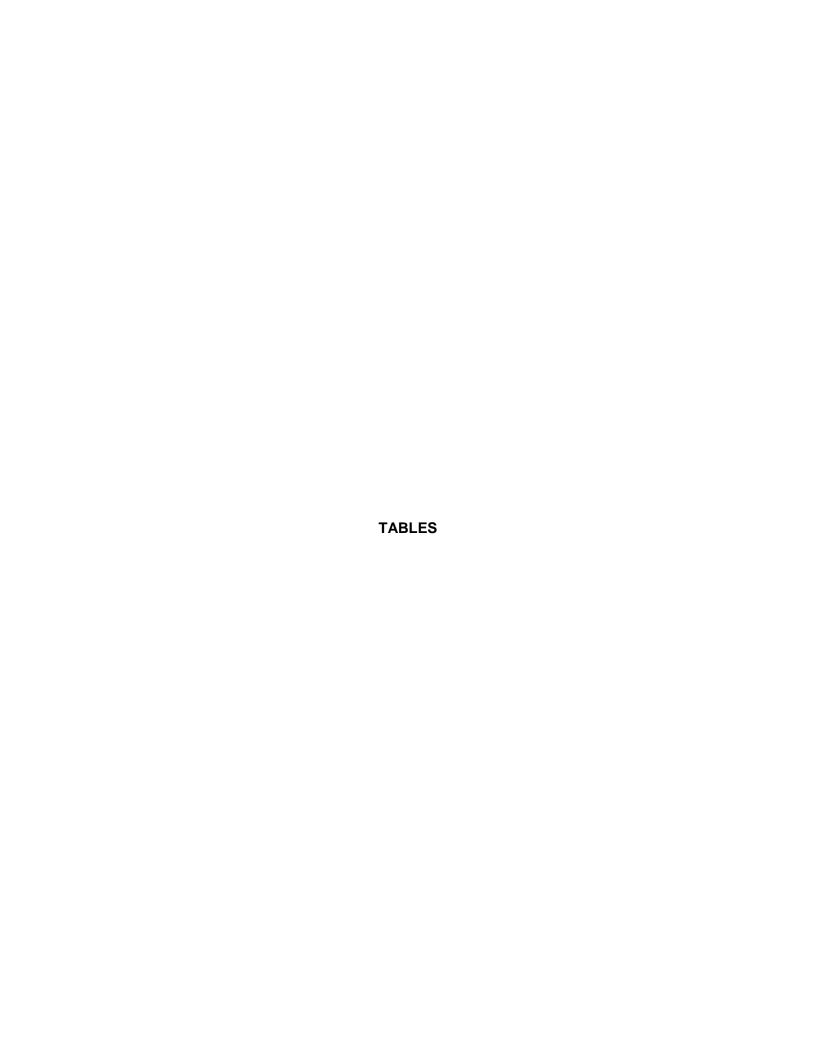


Table 1 September-October 2016 Semi-Annual Monitoring Program - PFC Monitoring **Delaware Sand & Gravel Superfund Site** New Castle, Delaware

		FSWP Revision 2
Sample ID	PFC Monitoring	(October 2011) Sample Location?
Drum Disposal Area (DDA)	Vicinity Monitoring Wel	lls
DDA-01	X	Yes
DDA-02	X	Yes
DDA-03	X	Yes
DDA-05	X	Yes
DDA-07-US	Х	Not included in FSWP
DDA-10-US	Х	Revision 2. Installed as
DDA-11-LS	Х	part of Supplemental
DDA-11-US	Х	Remedial Investigation
DDA-12-US	Х	Activities in Fall 2012.
DDA-15-US	Х	Activities in Fail 2012.
DDA-16-US	Х	See Notes.
DDA-17	Х	See Notes.
DGC-2S	Х	Yes
DGC-5	Х	Yes
DGC-7S	X	Yes
MHW-1D	Х	Yes
Wells Downgradient of the	DS&G and ACL Sites	
AWC-E1 at 132 ft bgs	Х	-
AWC-E1 at 156 ft bgs	Х	-
AWC-E2 at 140 ft bgs	Х	-
AWC-E2 at 165 ft bgs	Х	-
AWC-G3R	۸	Yes
AWC-K1	Х	Yes
BW-1	Х	-
BW-2	Х	-
DGC-10D	X	Yes
DGC-10S	Х	Yes
DGC-11D	Х	Yes
DGC-11S	Х	Yes
DGC-8D	Х	-
DGC-8S	Х	-
MW-18	X	Yes***
MW-26N	X	Yes***
MW-28	X	-
MW-29	X	-
MW-22N		-
MW-34	X	Yes***
P-4_UPA	X	-
P-5L	Х	-
P-5U	Х	-
MW-40		-
RT-1-UP	Х	Yes
UPA-01	X	Yes
BW-3		-
UPA-02S	Х	Yes
UPA-03D	X	Yes
UPA-101-TZ	X	Not included in FSWP Rev 2.
UPA-101-US	Х	Installed in Fall 2013.
001 00		

Notes:

- 1) A synoptic round of water level measurements was collected after the monitoring event.
- 2) The following quality assurance/quality control (QA/QC) samples were collected during the monitoring event at a rate of 1 per 20 primary samples: field duplicates, field equipment rinsate blanks, matrix spikes and matrix spike duplicates.
- 3) Trip blanks accompanied each shipment of samples (1 per day).
- 4) FSWP = Feasibility Study Work Plan
- 5) UPA = Upper Potomac Aquifer 6) NCC = New Castle County
- 7) AWC = Artesian Water Company
- 8) PFC = Perfluorinated Compound
- 9) ft bgs = feet below ground surface
- Indicates well was not included as a FSWP Revision 2 sample location
- *** Initially sampled in April 2012 to collect additional FS parameters, but due to detections in well P-6_(UPA), these area wells remained in the monitoring program.
- ^ Well was not sampled during the September-October 2016 sampling event due to denial of access by AWC

Prepared by: TGB Checked by: BPC Reviewed by: TAM



Table 2 September-October 2016 Semi-Annual Monitoring Program - Summary of Detected PFCs Delaware Sand & Gravel Superfund Site New Castle, Delaware

		_	ample ID		DA-05		DDA			DA-02		DA-03			-07-U	_		-10-US		DA-11-	-		\-11-U		DDA-12-l		DA-15-			GC-8S		DGC-8D		OGC-10I			C-10S
		Sam	nple Date	9/2	27/2016		9/27/	2016	9/	28/2016	9/	29/201	6	10/1	0/2010	6	10/5	5/2016	(9/27/201	16	9/2	7/2016	6	9/29/201	6 1	0/6/20	16	10	/6/201	6	10/6/2016	; P	9/29/201	16	9/2	9/2016
	N=Norn	nal, FD=Field I	Duplicate	9	N		١	1		N		N			N			N		N			N		N		N			N		N		N			N
Parameter	Unit	CAS	HA	Result	Qual R	DL Re	esult Q	ual RD	L Resul	t Qual RD	L Resul	t Qual	RDL	Result	Qual	RDL I	Result	Qual RI	DL Resi	ılt Qua	I RDL	Result	Qual	RDL I	Result Qual	RDL Resu	It Qua	I RDL	Result	Qual	RDL	Result Qual	RDL Resu	ılt Qual	ı RDL	Result	Qual RDL
Perfluorohexanoic acid	ng/l	307-24-4	NE	29	J-	1 2	29	1	25	1	61		1	25		1	43	J .	1 25		1	27		1	60	1 21		1	31	J-	1	13	1 21		1	20	1
Perfluoroheptanoic acid	ng/l	375-85-9	NE	13		1 2	22	1	22	J- 1	48	J-	1	16		1	23	J .	1 20	J+	1	23		1	34	1 17		1	8		1	8	1 13		1	13	1
Perfluorooctanoic acid (PFOA)	ng/l	335-67-1	70	76	J-	1 1	80	1	150	1	600		10	150		1	180	J ·	140)	1	150		1	230	1 200		1	34		1	49	1 110		1	38	1
Perfluorononanoic acid	ng/l	375-95-1	NE	2	J	1 1	10	1	12	1	12		1	9		1	7	J .	10	J	1	13		1	13	1 5	J+	1	5		1	3 J+	1 3		1	13	1
Perfluorodecanoic acid	ng/l	335-76-2	NE		U	1	2 .	J+ 1	1	J 1	7		1	1	J	1	2	J .	1 2	J+	1	3		1	2 J	1 1	J+	1	2		1	1 J+	1 5		1	12	1
Perfluoroundecanoic acid	ng/l	2058-94-8	NE		U	2		U 2		U 2		UJ	2		U	2		UJ 2	2	U	2		U	2	U	2	U	2		U	2	U	2	U	2	4	J 2
Perfluorododecanoic acid	ng/l	307-55-1	NE		UJ	3		U 3		U 3		UJ	3		U	3		UJ :	3	U	3		U	3	U	3	U	3		U	3	U	3	U	3		U 3
Perfluorotridecanoic acid	ng/l	72629-94-8	NE		UJ	2		U 2		U 2		UJ	2		U	2		UJ 2	2	U	2		U	2	U	2	U	2		U	2	U	2	U	2		U 2
Perfluorotetradecanoic acid	ng/l	376-06-7	NE		UJ	3		U 3		U 3		UJ	3		U	3		UJ :	3	U	3		U	3	U	3	U	3		U	3	U	3	U	3		U 3
Perfluorobutane Sulfonate	ng/l	29420-43-3	NE		UJ	4	_	JJ 4	6	J 4		U	4		U	4		UJ 4	1	UJ	4		UJ	4	U	4	U	4		U	4	U	4	U	4		U 4
Perfluorohexane Sulfonate	ng/l	108427-53-8	NE		U	4 4	41	4	19	4	73		4	21		4	53	J 4	1 14	J+	4	7	J	4	25	4 26		4		U	4	17	4 35		4	18	4
Perfluorooctane Sulfonate (PFOS)	ng/l	1763-23-1	70	7	J	5 2	29	5	18	5	64		5	19		5	16	J+ :	5 14	J	5	23		5	19	5 22		5		U	5	12	5 24		5	15	5
N-methyl perfluorooctanesulfonamidoacetic A	cid ng/l	2355-31-9	NE		U	4		U 4		UJ 4	4	J	4		U	4		UJ 4	1	U	4		U	4	UJ	4	U	4		U	4	U	4	UJ	4		UJ 4
N-ethyl perfluorooctanesulfonamidoacetic Acid	d ng/l	2991-50-6	NE		UJ	5	ı	JJ 5		U 5		UJ	5		U	5		UJ :	5	UJ	5		UJ	5	U	5	U	5		U	5	U	5	UJ	5		UJ 5
Total PFOA + PFOS	ng/l	NA	70	83		2	209		168		664			169			196		154	1		173			249	222			34			61	134			53	



Table 2 September-October 2016 Semi-Annual Monitoring Program - Summary of Detected PFCs Delaware Sand & Gravel Superfund Site New Castle, Delaware

		S	Sample ID	DD/	4-16-US	S	DDA-17	7	DO	C-2S		DGC	-5		DGC-	5	DO	C-7S	N	IHW-1D		OGC-11	D	DGC-11S	RT-	1-UP		UF	PA-01	U	JPA-02D)	UF	PA-02S		UPA-03	JD.
		San	nple Date	9/2	7/2016		9/28/201	16	9/2	7/2016		10/10/2	2016	10)/10/20	016	10/1	0/2016	10	0/6/2016	1	0/3/201	16	10/3/2016	10/5	/2016	;	10/6	6/2016	9/	/29/2016	ô	9/2	29/2016	,	10/3/20	16
	N=Norn	nal, FD=Field	Duplicate	9	N		N			N		FD			Ν			N		N		N		N		N			N		N			N		FD	
Parameter	Unit	CAS	HA	Result	Qual F	RDL Resu	ılt Qual	RDL	Result	Qual F	RDL Re	sult Qu	al RD	L Resu	lt Qua	al RDL	Result	Qual RD	L Resul	t Qual F	RDL Resu	ılt Qual	I RDL	Result Qual RD	L Result C	Qual I	RDL R	Result	Qual RI	OL Resul	t Qual	RDL	Result	Qual	RDL Re	sult Qua	I RDL
Perfluorohexanoic acid	ng/l	307-24-4	NE	29		1 57		1	34		1 4	14	1	55		1	23	1	",		1 22	J	1	UJ 1	3		1	38	J- ′	1 27		1	44		1 4	45 J	1
Perfluoroheptanoic acid	ng/l	375-85-9	NE	20	J+	1 34	J+	1	23	J+	1 2	29	1	31	J+	1	16	1	31		1 12	J	1	UJ 1		U	1	23	,	1 18		1	21		1 2	26 J	1
Perfluorooctanoic acid (PFOA)	ng/l	335-67-1	70	200		1 290)	1	200		1 10	60	1	190		1	130	1	280		1 43	J+	1	UJ 1	2		1	120	,	1 180		1	60		1 17	70 J	1
Perfluorononanoic acid	ng/l	375-95-1	NE	7	J	1 7	J+	1	9	J+	1 :	5 J	+ 1	6	J+	1	10	1	13	J+	1 13	J	1	UJ 1		U	1	6	,	1 9		1	2		1 8	8 J	1
Perfluorodecanoic acid	ng/l	335-76-2	NE	1	J+	1 2	J+	1		U	1	l	J 1		U	1	1	J 1	2		1 3	J	1	UJ 1		U	1	5	,	1 3		1		U	1 1	3 J+	1
Perfluoroundecanoic acid	ng/l	2058-94-8	NE		U	2	U	2		U	2	l	J 2		U	2		U 2		U	2	UJ	2	UJ 2		U	2		U :	2	U	2		U	2	UJ	2
Perfluorododecanoic acid	ng/l	307-55-1	NE		U	3	U	3		U	3	L	J 3		C	3		U 3		U	3	UJ	3	UJ 3		U	3		U 3	3	U	3	1	UJ	3	UJ	3
Perfluorotridecanoic acid	ng/l	72629-94-8	NE		U	2	U	2		U	2	l	J 2		U	2		U 2		U	2	UJ	2	UJ 2		U	2		U 2	2	U	2		UJ	2	UJ	2
Perfluorotetradecanoic acid	ng/l	376-06-7	NE		U	3	U	3		U	3	l	J 3		U	3		U 3		U	3	UJ	3	UJ 3		U	3		U 3	3	U	3		UJ	3	UJ	3
Perfluorobutane Sulfonate	ng/l	29420-43-3	NE		UJ	4	U	4		UJ	4	L	J 4		C	4		U 4		U	4	UJ	4	UJ 4		U	4		U	4	U	4	1	U	4	UJ	4
Perfluorohexane Sulfonate	ng/l	108427-53-8	NE	17		4 56	J+	4	6	J	4	7 .	4	7	J	4	9	J 4	14		4	UJ	4	UJ 4		U	4	52	- 1	4 34		4	5	J	4 1′	10 J+	4
Perfluorooctane Sulfonate (PFOS)	ng/l	1763-23-1	70	17	J+	5 34	J+	5	12	J+	5 9	9 .	5	12		5	15	5	16		5 7	J+	5	UJ 5		U	5	29		5 21		5		U	5 5	50 J+	5
N-methyl perfluorooctanesulfonamidoacetic A	.cid ng/l	2355-31-9	NE		U	4	U	4		U	4	l	J 4		U	4		U 4		U	4	UJ	4	UJ 4		U	4		U	4	UJ	4		UJ	4	UJ	4
N-ethyl perfluorooctanesulfonamidoacetic Aci	d ng/l	2991-50-6	NE		UJ	5	U	5		UJ	5	ι	J 5		U	5		U 5		U	5	UJ	5	UJ 5		U	5		U 5	5	UJ	5		UJ	5	UJ	5
Total PFOA + PFOS	ng/l	NA	70	217		324	l I		212		10	69		202			145		296		50			0	2			149		201			60		2:	20	



Table 2 September-October 2016 Semi-Annual Monitoring Program - Summary of Detected PFCs Delaware Sand & Gravel Superfund Site New Castle, Delaware

		(Sample ID	_	PA-03D		AWC-I			VC-E1		BW-1		_	W-2		MW-18	-		W-26N			W-28		MW			MW-29			MW-31			IW-34		-	_UPA		P-5L	
			mple Date		0/3/2016		10/13/20	016	10/1	3/2016	1	0/4/20	16	10/	4/2016	i	10/7/201	16	10	/3/201	6	10/	5/2016		10/5/	2016	1	0/5/20	16	10)/5/201	6	10/	7/2016	,	10/1	4/2016		10/7/20	/16
	N=Norr	mal, FD=Field	Duplicate		N		FD			N		N			N		N			N			N		FI			N			N			N			N		N	
Parameter	Unit	t CAS	HA	Resul	t Qual F	RDL Re	esult Qua	al RDL	Result	Qual RD	L Resu	lt Qua	al RDL	Result	Qual I	RDL I	Result Qua	I RDL	Result	Qual	RDL	Result	Qual I	RDL Re	sult Q	ual RD	L Resu	lt Qua	I RDL	Result	t Qual	RDL	Result	Qual	RDL F	≀esult C	≀ual RΓ	DL Resu	ult Qua	RDL
Perfluorohexanoic acid	ng/l	307-24-4	NE	51	J	1 :	29	1	29	1	25	J	1	20	J	1	28 J-	1	20	J	1	40		1 3	80	J 1	31	J	1	40	J-	1	18		1	86	1	9		1
Perfluoroheptanoic acid	ng/l	375-85-9	NE	29	J+	1	16	1	16	1	16	J	1	13	J	1	20	1	11	J+	1	23		1 1	9	J 1	19	J	1	28		1	10	, T	1	33	1	5	J+	1
Perfluorooctanoic acid (PFOA)	ng/l	335-67-1	70	180	J	1	86	1	84	1	130	J	1	83	J	1	150 J-	1	87	J	1	54		1 1:	30	J 1	120	J	1	190	J-	1	66		1	170	1	1 35		1
Perfluorononanoic acid	ng/l	375-95-1	NE	8	J+	1	10	1	10	1	10	J+	1	9	J	1	6	1	4	J+	1	3	J+	1 9	9	J 1	9	J	1	6		1	5		1	68	1	1	J+	1
Perfluorodecanoic acid	ng/l	335-76-2	NE	13	J+	1	2	1	3	1		UJ	1	2	J	1	2 J	1	1	J+	1		U	1 :	2	J 1	2	J	1		U	1		U	1	1	J 1	i T	U	1
Perfluoroundecanoic acid	ng/l	2058-94-8	NE		UJ	2	U	2		U 2		UJ	2		UJ	2	U	2		UJ	2		U	2	Ų	JJ 2		UJ	2		U	2		U	2		U 2	2	U	2
Perfluorododecanoic acid	ng/l	307-55-1	NE		UJ	3	U	3		U 3		UJ	3		UJ	3	U	3		UJ	3		U	3	Ų	JJ 3		UJ	3		UJ	3		U	3		U 3	5	U	3
Perfluorotridecanoic acid	ng/l	72629-94-8	NE.		UJ	2	U	2		U 2		UJ	2		UJ	2	U	2		UJ	2		U	2	ι	JJ 2		UJ	2		UJ	2		U	2		U 2	2	U	2
Perfluorotetradecanoic acid	ng/l	376-06-7	NE		UJ	3	U	3		U 3		UJ	3		UJ	3	U	3		UJ	3		U	3	l	JJ 3		UJ	3		UJ	3		U	3		U ?	3	U	3
Perfluorobutane Sulfonate	ng/l	1 29420-43-3	NE.		UJ	4	U	4		U 4		UJ	4		UJ	4	U	4		UJ	4	6	J	4	Ų	JJ 4		UJ	4	4	J	4		U	4	29		1	U	4
Perfluorohexane Sulfonate	ng/l	108427-53-8	8 NE	110	J	4	10 J	4	9	J 4	16	J	4	11	J	4	25	4	17	J	4	8	J	4 1	0	J 4	10	J	4	10		4	14		4	190		7	J	4
Perfluorooctane Sulfonate (PFOS)	ng/l	1763-23-1	70	55	J+	5	11	5	10	J 5	18	J+	5	17	J	5	47	5	11	J+	5	9	J	5 12	20	J 5	130	J	5	100		5	14		5	28	Ę	5 ز	J	5
N-methyl perfluorooctanesulfonamidoacetic A	id ng/l	2355-31-9	NE		UJ	4	U	4		U 4		UJ	4		UJ	4	U	4		UJ	4		U	4	l	JJ 4		UJ	4		U	4		U	4		U	į.	U	4
N-ethyl perfluorooctanesulfonamidoacetic Acid	ng/l	2991-50-6	NE		UJ	5	U	5		U 5		UJ	5		UJ	5	U	5		UJ	5		U	5	ı	JJ 5		UJ	5	25		5		U	5		U 5	ز	U	5
Total PFOA + PFOS	ng/l	l NA	70	235			97		94		148			100			197		98			63		2	50		250			290		/	80	,		198		40	1	



Table 2
September-October 2016 Semi-Annual Monitoring Program - Summary of Detected PFCs
Delaware Sand & Gravel Superfund Site
New Castle, Delaware

			ample ID		P-5U			P-6_UP			A-101-		_	A-101-			AWC-E		1	AWC-E	_	1	AWC-E	_		AWC-K	
		Sam	ple Date	1	0/7/201	6	9	/28/201	16	9	/28/201	6	9.	/28/201	6	10	0/13/20	16	10	0/13/20	16	10	0/13/20	16	10)/13/20	16
	N=Norn	nal, FD=Field D	Duplicate	2	N			N			N			N			N			N			N			N	
Parameter	Unit	CAS	HA	Result	Qual	RDL																					
Perfluorohexanoic acid	ng/l	307-24-4	NE	46		1	38	J-	1	47	J-	1	52		1	30		1	30		1	33		1	7		1
Perfluoroheptanoic acid	ng/l	375-85-9	NE	23		1	33		1	22	J+	1	29	J+	1	15	J+	1	12		1	15		1	4	J+	1
Perfluorooctanoic acid (PFOA)	ng/l	335-67-1	70	76		1	140	J-	1	130		1	210		1	76		1	110		1	130		1	23		1
Perfluorononanoic acid	ng/l	375-95-1	NE	8		1	10		1	4		1	8		1	12	J+	1	6		1	5		1	2	J+	1
Perfluorodecanoic acid	ng/l	335-76-2	NE	4		1	4		1		כ	1	5		1	4		1	3		1	3		1		U	1
Perfluoroundecanoic acid	ng/l	2058-94-8	NE	5		2		U	2		U	2		U	2		U	2		U	2		U	2		U	2
Perfluorododecanoic acid	ng/l	307-55-1	NE		U	3		U	3		U	3		U	3		C	3		U	3		UJ	3		U	3
Perfluorotridecanoic acid	ng/l	72629-94-8	NE		U	2		U	2		U	2		U	2		U	2		U	2		UJ	2		U	2
Perfluorotetradecanoic acid	ng/l	376-06-7	NE		U	3		U	3		כ	3		U	3		U	3		U	3		UJ	3		U	3
Perfluorobutane Sulfonate	ng/l	29420-43-3	NE		U	4		U	4		U	4		U	4		C	4		U	4		U	4		U	4
Perfluorohexane Sulfonate	ng/l	108427-53-8	NE		U	4	44		4	8	J	4	50	J+	4	8	J	4	30		4	26		4	6	J	4
Perfluorooctane Sulfonate (PFOS)	ng/l	1763-23-1	70		U	5	21		5		U	5	37		5	11		5	14		5	15		5	6	J	5
N-methyl perfluorooctanesulfonamidoacetic Ac	d ng/l	2355-31-9	NE		Ū	4		U	4		UJ	4		U	4		U	4		U	4		U	4		U	4
N-ethyl perfluorooctanesulfonamidoacetic Acid	ng/l	2991-50-6	NE		U	5		U	5		UJ	5		U	5		U	5		U	5		U	5		U	5
Total PFOA + PFOS	ng/l	NA	70	76			161			130			247			87			124			145			29		



Table 2

September-October 2016 Semi-Annual Monitoring Program - Summary of Detected PFCs Delaware Sand & Gravel Superfund Site New Castle, Delaware

Notes:

Green highlight = Concentration exceeds HA

Abbreviations:

HA = the May 19, 2016 USEPA health advisory (HA) of 70 nanograms per liter (ng/l; parts per trillion [ppt]) for perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), and/or the combined concentrations of PFOA and PFOS

ng/L = nanograms per liter Qual = interpreted qualifier RDL = reporting detection limit NE = standard does not exist

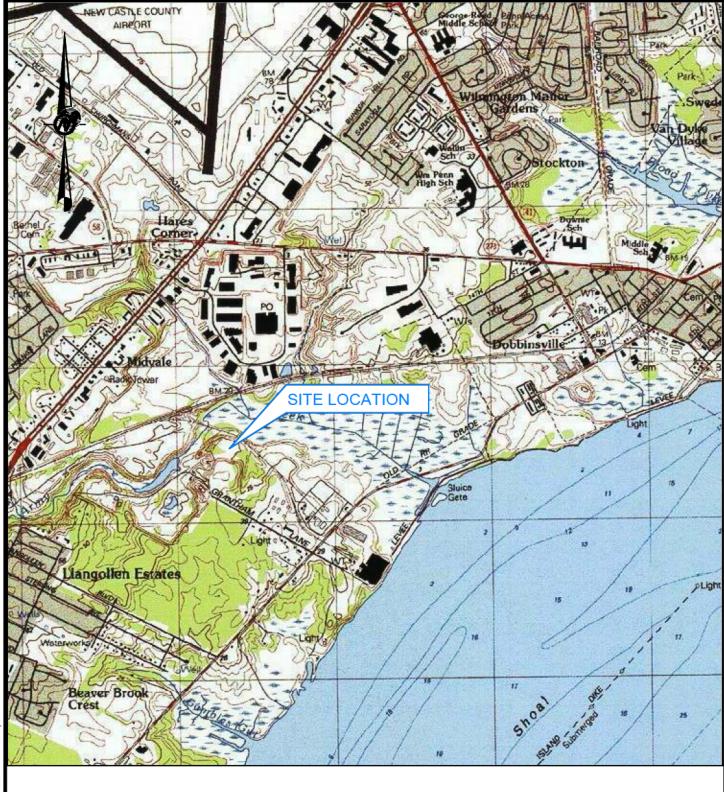
PFCs = perfluorinated compounds

Qualifiers:

- J The analyte is present; however, the reported value may not be accurate or precise.
- J+ The analyte is present; however, the reported value may not be accurate or precise. The result is biased high.
- J- The analyte is present; however, the reported value may not be accurate or precise. The result is biased low.
- U not detected above RDL
- UJ not detected above RDL, RDL is estimated

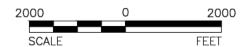
Prepared by: AZ Checked by: BPC Reviewed by: RWB





REFERENCE

1.) BASE MAP TAKEN FROM U.S.G.S. 7.5 MINUTE QUADRANGLE OF WILMINGTON SOUTH, DELAWARE, DATED 1993.



Golder
Manchester, New Hampshire

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TLE No.	. ()13	6052	Z006	3.dwg	
PROJECT	No.	01	3-60	052	REV.	0

SCALE	AS SHOWN
DATE	08/10/12
DESIGN	RWB
CADD	MPB
CHECK	RWB
REVIEW	TAM

TITLE

SITE LOCUS MAP

DELAWARE SAND AND GRAVEL SUPERFUND SITE FIGURE 1

Feb 25, 2016 - 3

Drawing file: 0136052Z006.dwg



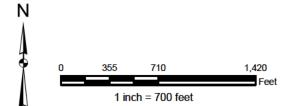
PROJECT

REFERENCES

Base Imagery taken from United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP), 2008.

Spatial Reference:

NAD 1983 HARN StatePlane Delaware FIPS 0700



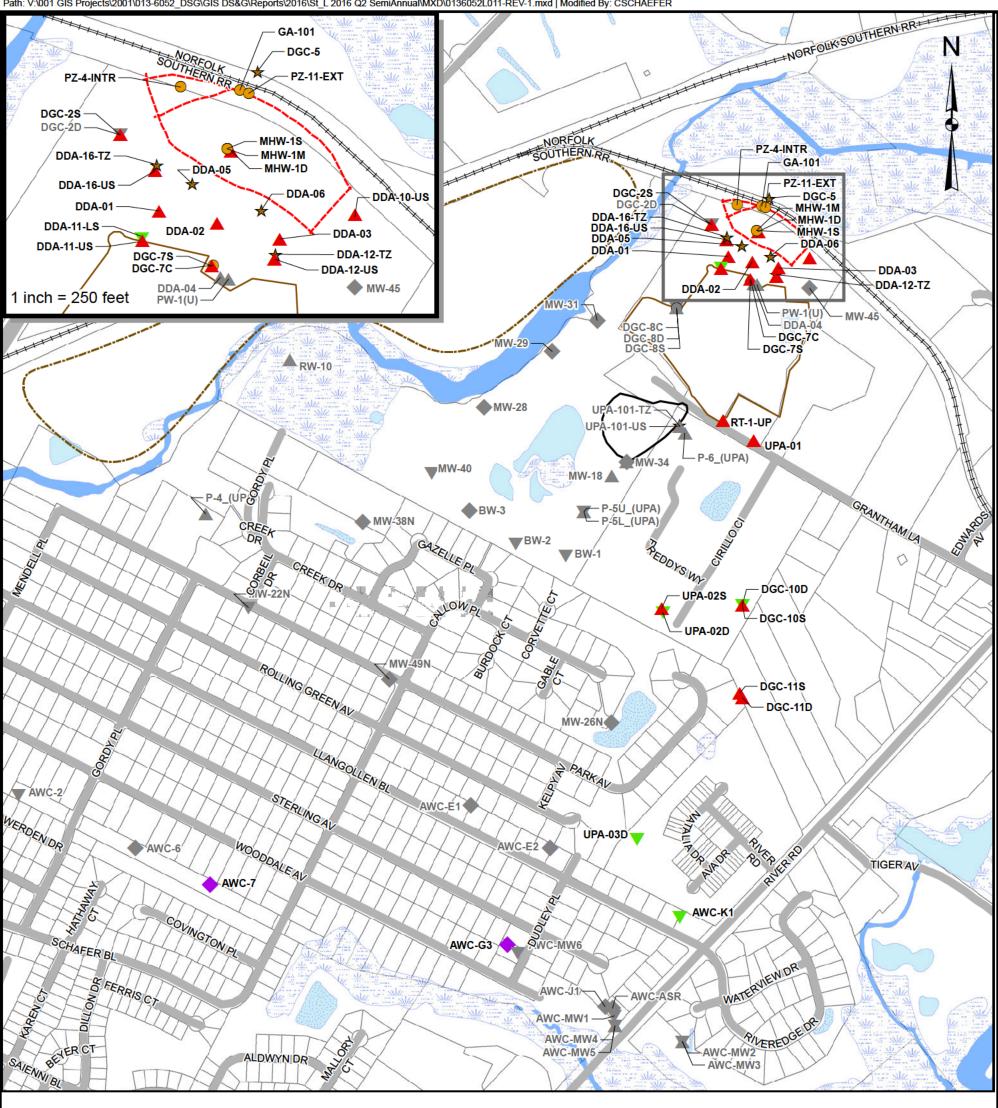
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REVIEW	CHECK	GIS	DESIGN	REV. 0	FILE No.	PROJECT No.	TITLE
/ TAM	RWB	CDS	CDS	SCALE		T No.	
8/30/2012	8/30/2012	8/13/2012	8/13/2012	AS SHOWN	Base_Site_Image	013-6052	

GENERAL SITE LAYOUT

Delaware Sand and Gravel Superfund Site New Castle, Delaware





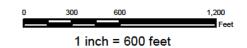
LEGEND

- Well screened in UPA Upper Sand included in DS&G's approved 2011 monitoring program
- Well screened in UPA Upper Sand not included in DS&G's approved 2011 monitoring program
- Well screened in UPA Lower Sand included in DS&G's approved 2011 monitoring program
- Well screened in UPA Lower Sand not included in DS&G's approved 2011 monitoring program Well screened across UPA Upper Sand and Lower Sand included in DS&G's approved 2011 monitoring program
- Well screened across UPA Upper Sand and Lower Sand not included in DS&G's approved 2011 monitoring program
- Well screened in Columbia Aquifer included in DS&G's approved 2011 monitoring program
- Well screened in Columbia Aquifer not included in DS&G's approved 2011 monitoring program

REFERENCE

Base data from New Castle County Delaware, Department of Land Use, "eParcel View Map" web site GIS data download. Data acquired 01/18/2012.

TITLE

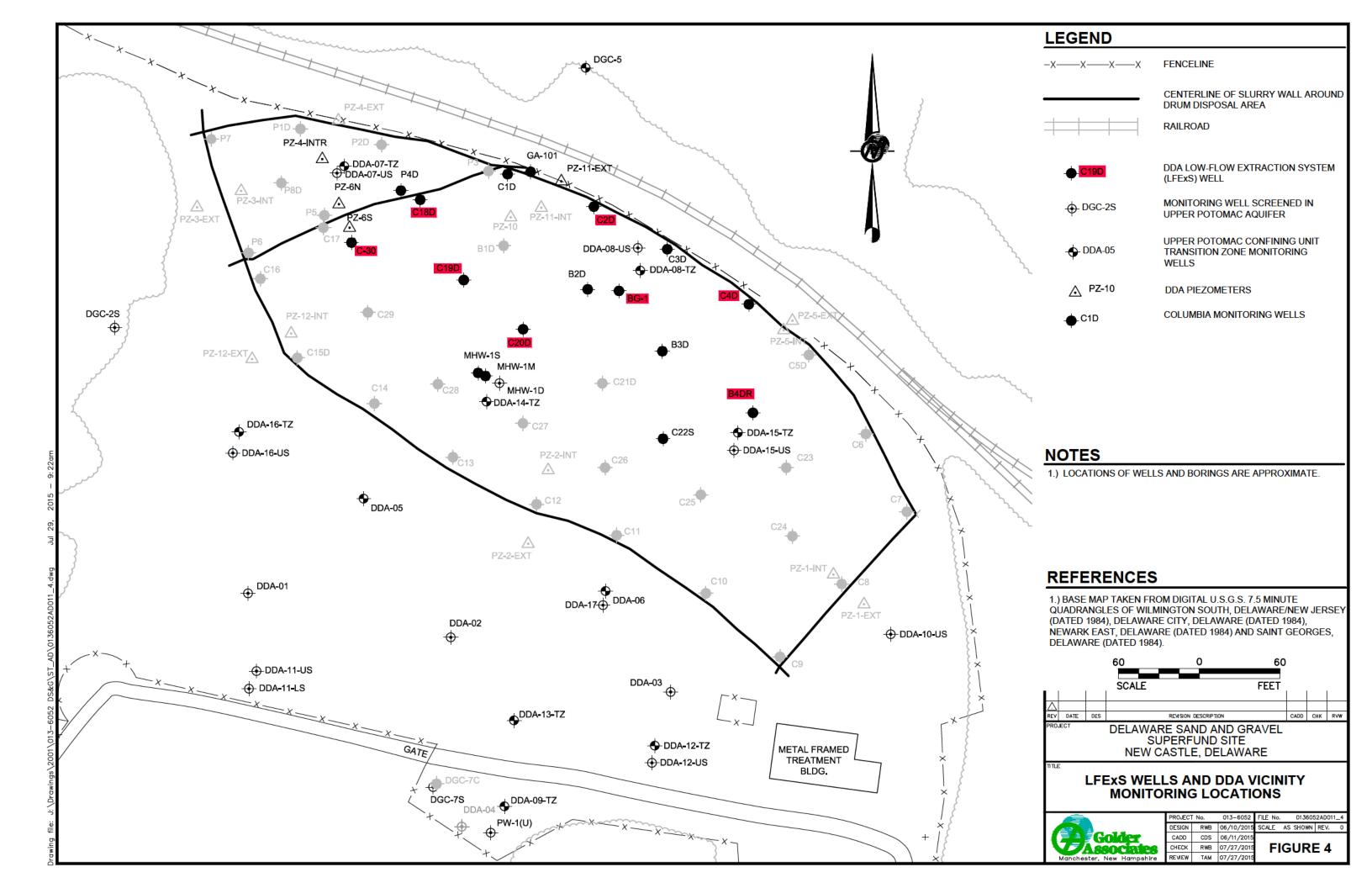


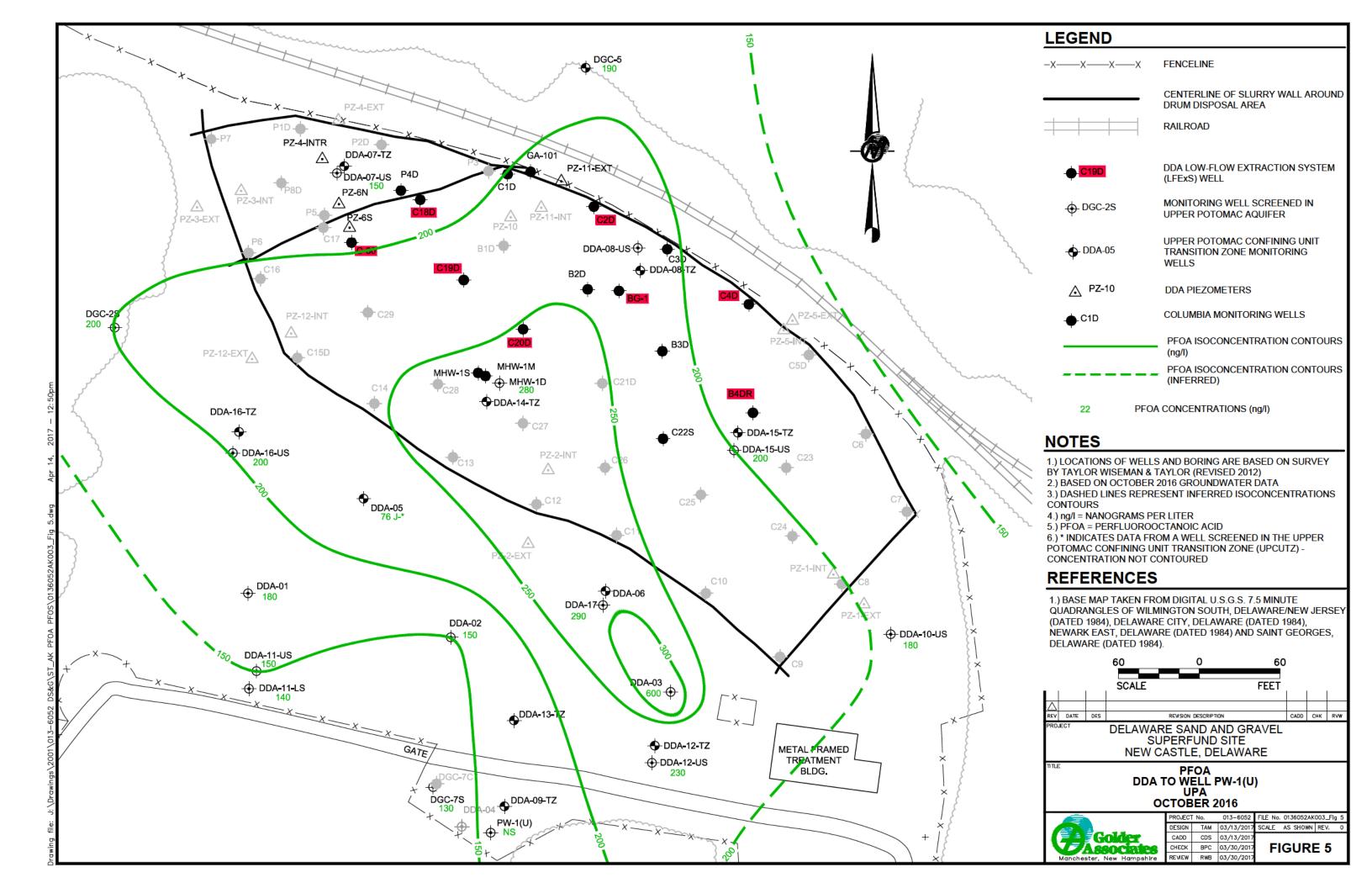
PROJECT

FIGURE 3	EVIEW TAM 8/28/2016	CHECK RWB 8/28/2016	HS AM 8/31/2016	ESIGN TAM 07/16/2015	REV. 1 SCALE: AS SHOWN	ILE No. 0136052L011-REV-1	ROJECT No. 013-6052.007
ယ	/2016	V2016	/2016	6/2015	NWOH	-REV-1	52.007

DOWNGRADIENT UPA MONITORING WELL LOCATIONS **Delaware Sand and Gravel** Superfund Site New Castle, Delaware







UPA UPPER SAND OCTOBER 2016

New Castle, Delaware



APPENDIX A

DATA QUALITY
ASSESSMENTS SEPTEMBEROCTOBER 2016 PFCs
GROUNDWATER MONITORING
EVENT
(Includes Form 1s)

February 2017 013-6052.012

Data Quality Assessment September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, DE

This report presents the findings of the data quality assessment performed on the analyses of environmental samples collected for the perfluoroalkyl compounds (PFCs) during the October 2016 Groundwater Monitoring Event. The groundwater monitoring was conducted at the Delaware Sand and Gravel (DS&G) Superfund Site (Site), located in New Castle, Delaware. Samples for this Monitoring Event were collected between September 27, 2016 and October 14, 2016. The chemical data for samples collected at the Site were evaluated to identify data quality issues which could affect the use of the data for decision making purposes. A total of 46 primary samples and the following Quality Assurance/Quality Control (QA/QC) samples were collected:

- Eleven (11) trip blanks;
- Eleven (11) field blanks;
- Four (4) equipment rinsate blanks;
- Four (4) matrix spike / matrix spike duplicate (MS/MSD) samples; and
- Four (4) field duplicate parameter sets.

All samples were analyzed for fourteen (14) PFCs² by Eurofins Lancaster Laboratories of Lancaster, Pennsylvania utilizing the following methodology:

■ PFCs by United States Environmental Protection Agency (USEPA) Method 537,

<u>Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1 (September 2009)</u>

Information regarding the sample point identifications, analytical methods, QC samples, sampling dates, and contract laboratory sample delivery group (SDG) designations are summarized in Table 1.

All groundwater results were validated following guidelines provided by USEPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (September 2016), as applicable to the above listed analytical method. In general, chemical results for the

Golder

\manchester\data\projects\2001\013-6052 ds&g\post fs\pfas\2017-03 pfas sampling memo\draft\appx\app a\data narrative 2016_10 pfcs gw docx

Reported PFCs include: Perfluorobutane Sulfonate, Perfluorohexanoic acid, Perfluorohexane Sulfonate, Perfluoroheptanoic acid, Perfluoroctanoic acid (PFOA), Perfluoroctane sulfonate (PFOS), Perfluorononanoic acid, Perfluorodecanoic acid, Perfluorodecanoic acid, Perfluorotetradecanoic acid, N-methyl perfluoroctanesulfonamidoacetic Acid, and N-ethyl perfluoroctanesulfonamidoacetic Acid

February 2017 013-6052.012

samples collected at the Site were qualified on the basis of outlying precision or accuracy parameters, or on the basis of professional judgment. The following definitions provide a brief explanation of the qualifiers which may have been assigned to data during the data evaluation process.

- J The analyte is present; however, the reported value may not be accurate or precise.
- J- The analyte is present; however, the reported value may not be accurate or precise. The result is biased low.
- The analyte is present; however, the reported value may not be accurate or precise. The result is biased high.
- The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate.

The data generated during this Groundwater Monitoring Event met the QC criteria established in the respective USEPA method and CLP guidelines, except as noted below. Qualifications may not have been required for all samples. Table 2 summarizes detailed qualifications applied to the data.

- All sample results in SDG DSG02 were qualified as estimated (J/UJ) when, due to laboratory error, samples were extracted outside the 14-day hold time.
- Select results were qualified as biased low for detected results (J-) and estimated for non-detect results (UJ) when surrogate recoveries were below QC criteria.
- Select results were qualified as biased high (J+) when surrogate recoveries were above QC criteria.
- Certain perfluorobutanesulfonate and n-ethyl perfluorooctanesulfonamidoacetic acid results were qualified as estimated (UJ) when the associated laboratory control sample recoveries were below QC criteria.
- Certain results were qualified as biased low (J-) when internal standard areas were above QC criteria.
- Select results were qualified as biased high for detected results (J+) and estimated for non-detect results (UJ) when internal standard areas were below QC criteria.
- Select results were qualified as estimated (J) when surrogate recoveries and internal standard areas were both below QC criteria, or when surrogate recoveries and internal standard areas were both above QC criteria.

Based on the data evaluations and data quality assessment, the analytical data for samples collected at the Site were determined to be acceptable (including estimated data) for their intended use. Generally acceptable levels of accuracy and precision, based on LCS, MS/MSD, field duplicate, and surrogate recoveries, were achieved for the data. In addition, the data completeness (i.e. the ratio of the amount of valid data obtained to the amount expected, including estimated data (J/J+/J-/UJ)) was 100%.



Sample Point Identifications September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, Delaware

SDG	Field ID	Matrix	Sample Date	PFCs	Field Duplicate	MS/MSD
Primary Samp		Macin	j Buto j	1100	Tiola Bapiloato	iiio,iiiob
DSG01	DDA-11-US	GW	9/27/2016	Х		
DSG01	DDA-11-LS	GW	9/27/2016	X		
DSG01	DDA-16-US	GW	9/27/2016	Х		
DSG01	DDA-01	GW	9/27/2016	Х		
DSG01	DGC-2S	GW	9/27/2016	Х		
DSG01	DDA-05	GW	9/27/2016	Х		
DSG01	UPA-101-T2	GW	9/28/2016	Х		
DSG01	UPA-101-US	GW	9/28/2016	Х		
DSG01	P-6 (UPA)	GW	9/28/2016	Х		
DSG01	DDA-02	GW	9/28/2016	Х		
DSG01	DDA-17	GW	9/28/2016	Х		
DSG01	DGC-10S	GW	9/29/2016	Х		
DSG01	DGC-10D	GW	9/29/2016	Х		
DSG01	UPA-02S	GW	9/29/2016	Х		
DSG01	UPA-02D	GW	9/29/2016	Х		
DSG01	DDA-12-US	GW	9/29/2016	Х		
DSG01	DDA-03	GW	9/29/2016	Х		
DSG02	FDGW 100316	GW	10/3/2016	Х	X (UPA-03D)	
DSG02	UPA-03D	GW	10/3/2016	Χ		
DSG02	MW-26N	GW	10/3/2016	Χ		Χ
DSG02	DGC-11D	GW	10/3/2016	Χ		
DSG02	DGC-11S	GW	10/3/2016	Χ		
DSG02	BW-2	GW	10/4/2016	Χ		
DSG02	BW-1	GW	10/4/2016	Χ		
DSG02	DDA-10-US	GW	10/5/2016	Χ		
DSG02	FDGW_100516	GW	10/5/2016	Χ	X (MW-29)	
DSG02	MW-29	GW	10/5/2016	Χ		
DSG03	MW-31	GW	10/5/2016	Χ		X
DSG03	RT-1UP	GW	10/5/2016	Χ		
DSG03	MW-28	GW	10/5/2016	Χ		
DSG03	DGC-8D	GW	10/6/2016	Χ		
DSG03	DGC-8S	GW	10/6/2016	X		
DSG03	MHW-1D	GW	10/6/2016	Χ		
DSG03	DDA-15-US	GW	10/6/2016	X		
DSG03	UPA-01	GW	10/6/2016	X		
DSG03	MW-18	GW	10/7/2016	X		
DSG03	MW-34	GW	10/7/2016	X		
DSG03	P-5L (UPA)	GW	10/7/2016	X		
DSG03	P-5U (UPA)	GW	10/7/2016	X	V (DOO 5)	
DSG05	FDGW 101016	GW	10/10/2016	X	X (DGC-5)	
DSG05	DGC-5	GW	10/10/2016	X		
DSG05	DDA-07-US	GW	10/10/2016	X		X
DSG05	DGC-7S	GW	10/10/2016	X	V (A)MO E4 (400)	
DSG05	FDGW_101316	GW	10/13/2016	X	X (AWC-E1 (132))	
DSG05	AWC-E1 (132)	GW	10/13/2016	X	+	V
DSG05	AWC-E2 (140)	GW	10/13/2016	X	+	X
DSG05	AWC-E1 (156)	GW	10/13/2016		+	
DSG05	AWC-K1	GW GW	10/13/2016	X	+	
DSG05 DSG05	AWC-E2(165)	GW	10/13/2016 10/14/2016	X	+	
inse Blanks	P-4 (UPA)	GVV	10/14/2016	^		
DSG01	RBGW1 092716	WQ	0/27/2016	X		
DSG01	RBGW1_092716 RBGW2_092716	WQ WQ	9/27/2016 9/27/2016	X	+	
DSG01	RBGW2_092716 RBGW3_092716	WQ	9/27/2016	X	+	
DSG01	RBGW3_092716 RBGW4_092716	WQ WQ	9/27/2016	X		



February 2017 Table 1 013-6052.012

Sample Point Identifications September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, Delaware

			1		1	1
SDG	Field ID	Matrix	Sample Date	<i>PFC</i> s	Field Duplicate	MS/MSD
Field Blanks	T TOTA TE	maanx	Duto		Tiola Dapiloato	ine, ine
DSG01	FBGW 092716	WQ	9/27/2016	Х		
DSG01	FBGW 092816	WQ	9/28/2016	X		
DSG01	FBGW_092916	WQ	9/29/2016	X		
DSG02	FBGW 100316	WQ	10/3/2016	X		
DSG02	FBGW 100416	WQ	10/4/2016	X		
DSG02	FBGW 100516	WQ	10/5/2016	Х		
DSG03	FBGW 100616	WQ	10/6/2016	Х		
DSG03	FBGW 100716	WQ	10/7/2016	Х		
DSG05	FBGW 101016	WQ	10/10/2016	Х		
DSG05	FBGW_101316	WQ	10/13/2016	Х		
DSG05	FBGW_101416	WQ	10/14/2016	Х		
Trip Blanks						
DSG01	TBGW_092716	WQ	9/27/2016	Х		
DSG01	TBGW_092816	WQ	9/28/2016	Х		
DSG01	TBGW_092916	WQ	9/29/2016	Х		
DSG02	TBGW 100316	WQ	10/3/2016	X		
DSG02	TBGW_100416	WQ	10/4/2016	Χ		
DSG02	TBGW 100516	WQ	10/5/2016	Х		
DSG03	TBGW_100616	WQ	10/6/2016	Х		
DSG03	TBGW_100716	WQ	10/7/2016	X		
DSG05	TBGW_101016	WQ	10/10/2016	Х		
DSG05	TBGW_101316	WQ	10/13/2016	Χ		
DSG05	TBGW_101416	WQ	10/14/2016	Χ		

Abbreviations:

GW - Groundwater

MS/MSD - Matrix Spike / Matrix Spike Duplicate

PFCs - Perfluoroalkyl compounds SDG - Sample Delivery Group WQ - Water, Quality Control



 Table 2
 013-6052.012

Data Qualifications

September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, Delaware

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
DSG01	DDA-11-US	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-11-LS	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-16-US	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-01	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DGC-2S	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-05	Perfluorobutanesulfonate	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-11-US	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-11-LS	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-16-US	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-01	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DGC-2S	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	DDA-05	n-Ethyl Perfluorooctanesulfonamidoacetic Acid	-	-	UJ	LCS/LCSD recovery below QC criteria
DSG01	UPA-101-TZ	Perfluoroheptanoic acid	-	-	J+	IS below QC criteria
DSG01	UPA-101-US	Perfluoroheptanoic acid	-	-	J+	IS below QC criteria
DSG01	DDA-02	Perfluoroheptanoic acid	-	-	J-	IS above QC criteria
DSG01	DDA-11-LS	Perfluoroheptanoic acid			J+	Surrogate recovery above QC criteria
DSG01	DDA-16-US	Perfluoroheptanoic acid	-	-	J+	Surrogate recovery above QC criteria
		Parfluarabentancia acid			J+	IS below QC criteria / Surrogate recovery
DSG01	DDA-17	Perfluoroheptanoic acid	-	-	J+	above QC criteria
		N mathyl parfluaragetapagulfanamidagestia Agid			UJ	IS below QC criteria / Surrogate recovery
DSG01	UPA-101-TZ	N-methyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	below QC criteria
		N othyl parfluorocatanogulfanomidocactic Acid	_		UJ	IS below QC criteria / Surrogate recovery
DSG01	UPA-101-TZ	N-ethyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	below QC criteria
DSG01	DDA-02	N-methyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	IS below QC criteria
		N-methyl perfluorooctanesulfonamidoacetic Acid			UJ	IS below QC criteria / Surrogate recovery
DSG01	DGC-10S	N-methyl peridolooctanesullonamidoacetic Acid	_	-	03	below QC criteria
		N-methyl perfluorooctanesulfonamidoacetic Acid	_	_	UJ	IS below QC criteria / Surrogate recovery
DSG01	UPA-02S	N-methyl perildolooctanesullonamidoacetic Acid	_	_	03	below QC criteria
		N-ethyl perfluorooctanesulfonamidoacetic Acid			UJ	IS below QC criteria / Surrogate recovery
DSG01	UPA-02S	N-ethyl perhabioocianesalionamiabacetic Acid	-	-	03	below QC criteria
DSG01	DDA-12-US	N-methyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	IS below QC criteria
		N-methyl perfluorooctanesulfonamidoacetic Acid	_	_	J	IS below QC criteria / Surrogate recovery
DSG01	DDA-03	14-methyr perhaorooctanesalionalmidoacetic Acid			3	below QC criteria
		N-ethyl perfluorooctanesulfonamidoacetic Acid	_	_	UJ	IS below QC criteria / Surrogate recovery
DSG01	DDA-03	N-ethyl perildolooctariesulloriamidoacetic Acid	_	-	03	below QC criteria
DSG01	DDA-03	Perfluoroheptanoic acid	-	-	J-	IS above QC criteria
		Perfluorooctane Sulfonate (PFOS)	_	_	J	IS above QC criteria / Surrogate recovery
DSG01	DDA-11-LS	1 chidolooctane odnonate (i 1 00)			J	above QC criteria
		Perfluorononanoic acid	_	_	J	IS above QC criteria / Surrogate recovery
DSG01	DDA-11-LS	1 chidorononanole acid			J	above QC criteria
		Perfluorononanoic acid	_	_	J	IS above QC criteria / Surrogate recovery
DSG01	DDA-16-US			_		above QC criteria
DSG01	DDA-11-LS	Perfluorodecanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-11-LS	Perfluorohexane Sulfonate	-	-	J+	Surrogate recovery above QC criteria



Table 2 013-6052.012

Data Qualifications

September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, Delaware

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
DSG01	DDA-16-US	Perfluorodecanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-16-US	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-01	Perfluorodecanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DGC-2S	Perfluoroheptanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DGC-2S	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG01	DGC-2S	Perfluorononanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-05	Perfluorododecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DDA-05	Perfluorotridecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DDA-05	Perfluorotetradecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DDA-05	Perfluorohexanoic acid	-	-	J-	Surrogate recovery below QC criteria
DSG01	DDA-05	Perfluorooctanoic acid (PFOA)	-	-	J-	Surrogate recovery below QC criteria
DSG01	UPA-101-TZ	Perfluorohexanoic acid	-	-	J-	Surrogate recovery below QC criteria
DSG01	UPA-101-US	Perfluorohexane Sulfonate	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-17	Perfluorohexane Sulfonate			J+	Surrogate recovery above QC criteria
DSG01	DDA-17	Perfluorononanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-17	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG01	DDA-17	Perfluorodecanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG01	P-6(UPA)	Perfluorohexanoic acid	-	-	J-	Surrogate recovery below QC criteria
DSG01	P-6(UPA)	Perfluorooctanoic acid (PFOA)	-	-	J-	Surrogate recovery below QC criteria
DSG01	DGC-10S	N-ethyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DGC-10D	N-methyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DGC-10D	N-ethyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	UPA-02S	Perfluorododecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	UPA-02S	Perfluorotridecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	UPA-02S	Perfluorotetradecanoic acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	UPA-02D	N-methyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	UPA-02D	N-ethyl perfluorooctanesulfonamidoacetic Acid	-	-	UJ	Surrogate recovery below QC criteria
DSG01	DDA-03	Perfluoroundecanoic acid			UJ	Surrogate recovery below QC criteria
DSG01	DDA-03	Perfluorododecanoic acid			UJ	Surrogate recovery below QC criteria
DSG01	DDA-03	Perfluorotridecanoic acid			UJ	Surrogate recovery below QC criteria
DSG01	DDA-03	Perfluorotetradecanoic acid			UJ	Surrogate recovery below QC criteria
DSG02	FDGW_100316	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	UPA-03D	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	MW-26N	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	DGC-11D	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	DGC-11S	All results	-	-	UJ	Sample extracted outside 14-day hold time
DSG02	BW-2	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	BW-1	All results	-	_	J/UJ	Sample extracted outside 14-day hold time
DSG02	DDA-10-US	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	FDGW_100516	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	MW-29	All results	-	-	J/UJ	Sample extracted outside 14-day hold time
DSG02	DGC-11D	Perfluorodecanoic acid	-	-	J	IS above QC criteria / Surrogate recovery above QC criteria.



Data Qualifications

September-October 2016 PFCs Groundwater Monitoring Event Delaware Sand & Gravel Superfund Site New Castle, Delaware

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
- 525	Campio Namo		- Non Rooux	NOW AL	quamor	IS above QC criteria / Surrogate recovery
DSG02	DDA-10-US	Perfluorodecanoic acid	-	-	J	above QC criteria.
		Porfluorabentancia acid			J	IS above QC criteria / Surrogate recovery
DSG02	FDGW-100316	Perfluoroheptanoic acid	-	-	J	above QC criteria.
		Perfluorononanoic acid	_	_	J	IS above QC criteria / Surrogate recovery
DSG02	FDGW-100316	1 cinadionandio dold				above QC criteria.
		Perfluoroheptanoic acid	_	_	J	IS above QC criteria / Surrogate recovery
DSG02	DGC-11D	·				above QC criteria.
DCCOO	DCC 44D	Perfluorononanoic acid	-	-	J	IS above QC criteria / Surrogate recovery
DSG02	DGC-11D					above QC criteria. IS above QC criteria / Surrogate recovery
DSG02	DDA-10-US	Perfluorononanoic acid	-	-	J	above QC criteria.
DSG02	MW-26N	Perfluorodecanoic acid	-	_	J+	Surrogate recovery above QC criteria
DSG02	MW-26N	Perfluorooctane Sulfonate (PFOS)		_	J+	Surrogate recovery above QC criteria
DSG02	MW-26N	Perfluorononanoic acid	 -	_	J+	Surrogate recovery above QC criteria
DSG02	FDGW-100316	Perfluorodecanoic acid	 -		J+	Surrogate recovery above QC criteria
DSG02	FDGW-100316	Perfluorooctane Sulfonate (PFOS)	-		J+	Surrogate recovery above QC criteria
DSG02	FDGW-100316	Perfluorohexane Sulfonate	<u> </u>	_	J+	Surrogate recovery above QC criteria
DSG02	UPA-03D	Perfluorodecanoic acid	 -	_	J+	Surrogate recovery above QC criteria
DSG02	UPA-03D	Perfluorooctane Sulfonate (PFOS)	_	_	J+	Surrogate recovery above QC criteria
DSG02	UPA-03D	Perfluorononanoic acid	_	_	J+	Surrogate recovery above QC criteria
DSG02	DGC-11D	Perfluorooctanoic acid (PFOA)	-	-	J+	Surrogate recovery above QC criteria
DSG02	DGC-11D	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG02	BW-1	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG02	BW-1	Perfluorononanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG02	DDA-10-US	Perfluorooctane Sulfonate (PFOS)	-	-	J+	Surrogate recovery above QC criteria
DSG02	MW-26N	Perfluoroheptanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG02	UPA-03D	Perfluoroheptanoic acid	-	-	J+	Surrogate recovery above QC criteria
DSG03	MW-31	Perfluorododecanoic acid			UJ	Surrogate recovery below QC criteria
DSG03	MW-31	Perfluorotridecanoic acid			UJ	Surrogate recovery below QC criteria
DSG03	MW-31	Perfluorotetradecanoic acid			UJ	Surrogate recovery below QC criteria
DSG03	MW-31	Perfluorohexanoic acid			J-	Surrogate recovery below QC criteria
DSG03	MW-31	Perfluorooctanoic acid (PFOA)			J-	Surrogate recovery below QC criteria
DSG03	MW-28	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG03	DGC-8D	Perfluorodecanoic acid			J+	Surrogate recovery above QC criteria
DSG03	DGC-8D	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG03	DGC-8S	Perfluorohexanoic acid			J-	Surrogate recovery below QC criteria
DSG03	MHW-1D	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG03	DDA-15-US	Perfluorodecanoic acid			J+	Surrogate recovery above QC criteria
DSG03	DDA-15-US	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG03	UPA-01	Perfluorohexanoic acid			J-	Surrogate recovery below QC criteria
DSG03	MW-18	Perfluorohexanoic acid			J-	Surrogate recovery below QC criteria
DSG03	MW-18	Perfluorooctanoic acid (PFOA)			J-	Surrogate recovery below QC criteria
DSG03	P-5L (UPA)	Perfluoroheptanoic acid			J+	Surrogate recovery above QC criteria



February 2017 Table 2 013-6052.012

Data Qualifications

September-October 2016 PFCs Groundwater Monitoring Event

Delaware Sand & Gravel Superfund Site New Castle, Delaware

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
DSG03	P-5L (UPA)	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG05	AWC-E1 (156)	Perfluoroheptanoic acid			J+	Surrogate recovery above QC criteria
DSG05	AWC-E1 (156)	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG05	AWC-K1	Perfluoroheptanoic acid			J+	Surrogate recovery above QC criteria
DSG05	AWC-K1	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG05	AWC-E2 (165)	Perfluorododecanoic acid			UJ	Surrogate recovery below QC criteria
DSG05	AWC-E2 (165)	Perfluorotridecanoic acid			UJ	Surrogate recovery below QC criteria
DSG05	AWC-E2 (165)	Perfluorotetradecanoic acid			UJ	Surrogate recovery below QC criteria
DSG05	FDGW_101016	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria
DSG05	DGC-5	Perfluoroheptanoic acid			J+	Surrogate recovery above QC criteria
DSG05	DGC-5	Perfluorononanoic acid			J+	Surrogate recovery above QC criteria

Abbreviations:

IS - internal standard

LCS/LCSD - laboratory control sample / laboratory control sample duplicate

QC - quality control RL - reporting limit

SDG - sample delivery group

Qualifiers:

J : estimated result

UJ: non-detect result; estimated RL

J-: biased low result J+: biased high result





December 14, 2016

Ms. Theresa Miller Golder Associates, Inc. 670 North Commercial Street, Suite 103 Manchester, NH 03101

Dear Theresa:

Per your request, Eurofins Lancaster Laboratories Environmental, LLC (ELLE) has investigated the mishandling of samples for ELLE entry group 1718978, samples 8635689-8635693 and samples 8635695-8635705. The investigation showed that the sample mishandling occurred during sample preparation. An Investigation and Corrective Action Report (ICAR) was issued. Department Management investigated the issues and the response was reviewed by QA. The information has been routed to ELLE senior management. The investigation is summarized below:

While reviewing the raw data, the analyst noticed that the results did not make sense for the batch Quality Control (QC) samples. The analyst checked the numbering on the extract vials to make sure they were correct. Then the analysts pulled remaining volume for each of the sample extracts and re-analyzed the extracts. The re-analyses of the initial extracts matched the initial analyses. This information indicated that the mishandling of the sample extracts occurred during the sample preparation process. As a matter of course, all samples were re-prepared and re-analyzed. Unfortunately, the re-extraction of all samples occurred outside of the technical holding time for sample extraction.

The manager of the Specialty Services department investigated the sample preparation issue. Initially, all sample containers are lined up next to extraction glassware set-ups and are labeled to match. There are two main points of transfer during the extraction process and with each transfer step the extracts are transferred from one set of labeled glassware to another. It is during one or both of the transfer steps that the mishandling/mislabeling of samples occurred. However, it cannot be ascertained in which step or steps the mishandling occurred. As corrective action, changes were implemented for both steps of the sample preparation process to minimize reoccurrence of sample mishandling. One of the corrective actions entailed how equipment was set-up. For this method, the extraction set-up is accessible from two sides (front and back). The process for equipment set-up has been changed to always be performed from one specific side to ensure that the correct sample is grabbed. The other corrective action entailed a change to the labeling program so that the sample labels would print in order of the set-up and not a random order and reduce the likelihood that an incorrect label was affixed the sample extracts. Furthermore, all personnel were re-trained on these procedure changes and reminded of the importance of proper sample handling/labeling.

I apologize for the errors with this data set and any inconvenience to you. Should you have any questions about the information provided, please contact me at 717-556-7327

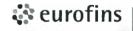
Sincerely,

Ruth Callaghan Principal Specialist Quality Assurance

RC/mc

cc: Nicole Maljovec (ELLE) Alison Zoll (email) Ross Bennett (email)

Ruth Callaghan



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

REVISED

Sample Description: RBGW1-092716 Rinsate Water

Delaware Sand & Gravel

LL Sample # WW 8619351 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Collected: 09/27/2016 09:05 Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

SDG#: DSG01-01RB RBGW1

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	i					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.		1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	10	1
10954	NETFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesulfo	namidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
_,	NMeFOSAA is the acronym for N-				ic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1. modified	1	1	16280013	10/18/2016 05	:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1. modified	1	1	16280013	10/07/2016 12	:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: RBGW2-092716 Rinsate Water

Delaware Sand & Gravel

LL Sample # WW 8619352 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 09:10 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

RBGW2 SDG#: DSG01-02RB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l	ng/l	ng/l	
	modifi	.ed				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1
10954	NETFOSAA	2991-50-6	N.D.	5	8	1
	NEtFOSAA is the acronym for	N-ethyl perfluoroc	octanesulfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for	N-methyl perfluoro	octanesulfonamido	acetic Acid.		
The	stated OC limits are advisors	only until suffic	ient data noints			

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 06	:12 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16280013	10/07/2016 12	:15 Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: RBGW3-092716 Rinsate Water

Delaware Sand & Gravel

LL Sample # WW 8619353

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 09:45 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

SDG#: DSG01-03RB RBGW3

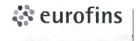
CAT No.	Analysis Name	CAS Number	Result			Meti		Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l			ng/	L		ng/l	
	modifie	ed								
10954	Perfluorooctanoic acid	335-67-1	N.D.			1			2	1
10954	Perfluorononanoic acid	375-95-1	N.D.			1			2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.			1			2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2			4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.			3			5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.			2			4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.			3			5	1
10954	Perfluorohexanoic acid	307-24-4	1	J		1			2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.			1			2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.			4			10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.			4			10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.			5			10	1
10954	NETFOSAA	2991-50-6	N.D.			5			8	1
	NEtFOSAA is the acronym for 1	N-ethyl perfluoroo	ctanesul	fonami	doaceti	c Acid				
10954	NMeFOSAA	2355-31-9	N.D.			4			8	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	1	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537		EPA 537 Rev. modified	1,1	1	16280013	10/18/2016 06:28	Jason W Knight	1
14091	PFAA Water Prep		EPA 537 Rev. modified	1.1	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

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REVISED

Sample Description: RBGW4-092716 Rinsate Water

Delaware Sand & Gravel

LL Sample # WW 8619354 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 09:50 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

RBGW4 SDG#: DSG01-04RB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	ng/l	
	modified	l				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1
10954	NETFOSAA	2991-50-6	N.D.	5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesulfonamidoaceti	.c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesulfonamidoacet	ic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 06:44	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: TBGW-092716 Trip Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619355

LL Group # 1715314

Account

05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

TBGW1 SDG#: DSG01-06TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.		1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1 100
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	10	1
10954	NEtFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for I	N-ethyl perfluoro	octanesulfo	namidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
The	NMeFOSAA is the acronym for I				ic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 07:01	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: FBGW-092716 Field Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619356 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 11:04 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

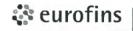
FBGW1 SDG#: DSG01-05FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	d					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.		1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	10	1
10954	NETFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N	-ethyl perfluoroc	ctanesulfonami	doacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanesulfonam	idoaceti	c Acid.		
The	stated QC limits are advisory	only until suffic	ient data point	S			
can	be obtained to calculate statis	stical limits.					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 07:17	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-11-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619357

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 11:50

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

SDG#: DSG01-07 DD11U

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	đ					
10954	Perfluorooctanoic acid	335-67-1	150		1	2	1 999 99
10954	Perfluorononanoic acid	375-95-1	13		1	2	1
10954	Perfluorodecanoic acid	335-76-2	3		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N,D,		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	27		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	23		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. UJ		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	7 J		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	23		5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesulfon	amidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
	NMeFOSAA is the acronym for N-	-methyl perfluoro	octanesulfo	namidoacet	ic Acid.		
The	stated OC limits are admissorer	mlss summil assettia	iont data no	date.			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16280013	10/18/2016 07:50	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-11-LS Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619358

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 11:55 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

DD11L SDG#: DSG01-08

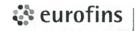
CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	140	1	2	1
10954	Perfluorononanoic acid	375-95-1	10 J	1	2	1
10954	Perfluorodecanoic acid	335-76-2	2 25+	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	25	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	20 丁十	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. VJ	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	14 J+	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	14 5	5	10	1
10954	NEtFOSAA	2991-50-6	N.D. U.J	5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesulfonamidoacetic	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacet:	ic Acid.		
The	stated QC limits are advisory only	y until suffic:	ient data points			

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 08:06	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

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REVISED

Sample Description: DDA-16-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619359 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 14:40 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

DDA16 SDG#: DSG01-09

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	ng/l		
	modifie	ed						
10954	Perfluorooctanoic acid	335-67-1	200		1	2	1	
10954	Perfluorononanoic acid	375-95-1	7 J		1	2	1	
10954	Perfluorodecanoic acid	335-76-2	1 🕺	T+	1	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	11.00	2	4	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1	
10954	Perfluorohexanoic acid	307-24-4	29		1	2	1	
10954	Perfluoroheptanoic acid	375-85-9	20 J+		1	2	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D. VJ		4	10	1	
10954	Perfluorohexanesulfonate	355-46-4	17		4	10	1	
10954	Perfluoro-octanesulfonate	1763-23-1	17 T+		5	10	1	
10954	NETFOSAA	2991-50-6	N.D. UJ		5	8	1	
	NEtFOSAA is the acronym for	N-ethyl perfluorod	octanesulfor	namidoaceti	c Acid.			
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1	
	NMeFOSAA is the acronym for	N-methyl perfluor	octanesulfo	namidoacet	ic Acid.			
The	stated OC limits are advisory	only until suffic	ient data n	ointe				

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. I modified	1.1	1	16280013	10/18/2016	08:23	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1 modified	1.1	1	16280013	10/07/2016	12:15	Devon M Whooley	1



Analysis Report

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REVISED

Sample Description: DDA-01 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619360 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 15:10 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

DDA01 SDG#: DSG01-10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	180	1	2	1
10954	Perfluorononanoic acid	375-95-1	1.0	1	2	1
10954	Perfluorodecanoic acid	335-76-2	2 J+	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	29	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	22	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. UJ	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	41	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	29	5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ	5	В	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesulfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesulfonamid	oacetic Acid.		
The	stated QC limits are advisory onl					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

can be obtained to calculate statistical limits.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 08:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DGC-2S Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619361

LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 15:50 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

DGC2S SDG#: DSG01-11

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	d					
10954	Perfluorooctanoic acid	335-67-1	200		1	2	1
10954	Perfluorononanoic acid	375-95-1	9 J+		1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	34		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	23 J+		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. UJ		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	6 J		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	12 J+		5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ		5	8	1
	NEtFOSAA is the acronym for N	-ethyl perfluorod	octanesulfona	midoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanesulfor	amidoacet	ic Acid.		
The	stated QC limits are advisory of	only until suffic	ient data po	ints			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16280013	10/18/2016 08:55	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-05 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619362 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/27/2016 16:25 by

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

SDG#: DSG01-12

DDA05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	76 T -	1	2	1
10954	Perfluorononanoic acid	375-95-1	2 J	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D. UT	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D. ∪ T	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D. UJ	3	5	1
10954	Perfluorohexanoic acid	307-24-4	29 5-	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	13	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. 13	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	7 J	5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ	5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesulfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacet:	ic Acid.		
The	stated OC limits are advisory only	v until suffici	ent data points			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

can be obtained to calculate statistical limits.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16280013	10/18/2016 09:12	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16280013	10/07/2016 12:15	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: TBGW-092816 Trip Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619363

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

TBGW2 SDG#: DSG01-13TB

CAT No.	Analysis Name	CAS Number	Result		Method Detect	ion Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l		ng/l		ng/l		
	modif	ied							
10954	Perfluorooctanoic acid	335-67-1	N.D.		1		2	1	
10954	Perfluorononanoic acid	375-95-1	N.D.		1		2	1	
10954	Perfluorodecanoic acid	335-76-2	N.D.		1		2	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2		4	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3		5	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2		4	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3		5	1	
10954	Perfluorohexanoic acid	307-24-4	N.D.		1		2	1	
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1		2	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4		10	1	
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4		10	1	
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5		10	1	
10954	NETFOSAA	2991-50-6	N.D.		5		8	1	
	NEtFOSAA is the acronym for	N-ethyl perfluoro	ctanesulfo	namidoaceti	ic Acid.				
10954	NMeFOSAA	2355-31-9	N.D.		4		8	1	
	NMeFOSAA is the acronym for	N-methyl perfluoro	octanesulf	onamidoacet	cic Acid.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 13:24	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: UPA-101-TZ Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619364 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 11:40 by 0

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

UPATZ SDG#: DSG01-14

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	130	1	2	1
10954	Perfluorononanoic acid	375-95-1	4	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	47 5-	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	22 J+	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	8 J	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1
10954	NETFOSAA	2991-50-6	N.D. UT	5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesulfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D. U.T	4	В	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro		.c Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



		Laborat	ory Sa	mple Analysi	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016	13:36	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016	09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: FBGW-092816 Field Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619365 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 11:41 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

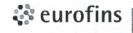
FBGW2 SDG#: DSG01-15FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	i i					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.		1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	10	1
10954	NEtFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesulfo	namidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
	NMeFOSAA is the acronym for N-	-methyl perfluoro	octanesulf	onamidoacet	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 13:48	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: UPA-101-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619366 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 12:05

by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

UPAUS SDG#: DSG01-16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	210	1	2	1
10954	Perfluorononanoic acid	375-95-1	8	1	2	1
10954	Perfluorodecanoic acid	335-76-2	5	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	52	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	29 J+	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	50 丁十	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	37	5	10	1
10954	NETFOSAA	2991-50-6	N.D.	5	8	1
	NEtFOSAA is the acronym for N-et	thyl perfluorood	ctanesulfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesulfonamidoaceti	c Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

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Laboratorv	Samble	Anaivsis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 14:00	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: P-6(UPA) Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619367

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 13:15 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

P-6PA SDG#: DSG01-17

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l		
	modifie	d.						
10954	Perfluorooctanoic acid	335-67-1	140 J		1	2	1	
10954	Perfluorononanoic acid	375-95-1	10		1	2	1	
10954	Perfluorodecanoic acid	335-76-2	4		1	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3 - 10 - 11	5	1	
10954	Perfluorohexanoic acid	307-24-4	38 J-		1	2	1	
10954	Perfluoroheptanoic acid	375-85-9	33		1	2	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1	
10954	Perfluorohexanesulfonate	355-46-4	44		4	10	1	
10954	Perfluoro-octanesulfonate	1763-23-1	21		5	10	1	
10954	NETFOSAA	2991-50-6	N.D.		5	8	1	
	NEtFOSAA is the acronym for N	ethyl perfluoroc	ctanesulfor	amidoaceti	c Acid.			
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1	
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanesulfo	namidoacet	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 R modified	ev. 1.1	1	16281008	10/18/2016 16:59	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 R	ev. 1.1	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-02 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619368 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 15:35 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

DDA02 SDG#: DSG01-18

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	150		1	2	1
10954	Perfluorononanoic acid	375-95-1	12		1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	J	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	25		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	22 J-		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	6	J	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	19		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	18		5	10	1
10954	NETFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesul	fonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D. 🗸	J	4	8	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesu	lfonamidoaceti	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record	Laboratory	Sample	Analysis	Record
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CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 14:34	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-17 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619369

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/28/2016 15:45 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

SDG#: DSG01-19

DDA17

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Limit of * Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	i					
10954	Perfluorooctanoic acid	335-67-1	290		1	2	1
10954	Perfluorononanoic acid	375-95-1	7 J+		1	2	1
10954	Perfluorodecanoic acid	335-76-2	2 J+		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	57		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	34 T+		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	56 J+		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	34 J+		5	10	1
10954	NETFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesulfo	namidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesulf	onamidoacet	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 I	Rev. 1.1	1	16281008	10/18/2016 14:47	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 I		1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: TBGW-092916 Trip Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619370 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

TBGW3 SDG#: DSG01-20TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA S	37 Rev. 1.1	ng/l	ng/l	ng/l	
	modif	Eied				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic aci	.d 376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1
10954	NEtFOSAA	2991-50-6	N.D.	5	8	1
	NEtFOSAA is the acronym fo	or N-ethyl perfluorood	ctanesulfona	midoacetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	8	1
	NMeFOSAA is the acronym fo	or N-methyl perfluoro	octanesulfon	amidoacetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Laboratory	Sample	whathere	Kecord

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 14:5	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1,	16281008	10/10/2016 09:3	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: FBGW-092916 Field Blank Water

Delaware Sand & Gravel

LL Sample # WW 8619371 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 10:44 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

FBGW3 SDG#: DSG01-21FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l		
	modifie	i						
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	2	1	
10954	Perfluorononanoic acid	375-95-1	N.D.		1	2	1	
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1	
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	2	1	
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	2	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1	
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1	
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	10	1	
10954	NETFOSAA	2991-50-6	N.D.		5	8	1	
	NEtFOSAA is the acronym for N	ethyl perfluoroc	ctanesulfor	namidoaceti	c Acid.			
10954	NMeFOSAA	2355-31-9	N.D.		4	8	1	
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanesulf	onamidoacet	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 15:11	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DGC-10S Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619372 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 10:55 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

SDG#: DSG01-22

DGCS-

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	38	1	2	1
10954	Perfluorononanoic acid	375-95-1	13	1	2	1
10954	Perfluorodecanoic acid	335-76-2	12	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	4 J	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	20	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	13	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	18	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	15	5	10	1
10954	NEtFOSAA	2991-50-6	N.D. VJ	5	8	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	N.D. UT	4	8	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesulfonamidoace	tic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ıe	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016	15:23	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16281008	10/10/2016	09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DGC-10D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619373

LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 11:00 by

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

DGCD- SDG#: DSG01-23

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 53	37 Rev. 1.1	ng/l		ng/l	ng/l		
	modif:	ied						
10954	Perfluorooctanoic acid	335-67-1	110		1	2	1	
10954	Perfluorononanoic acid	375-95-1	3		1	2	1	
10954	Perfluorodecanoic acid	335-76-2	5		1	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1	
10954	Perfluorohexanoic acid	307-24-4	21		1	2	1	
10954	Perfluoroheptanoic acid	375-85-9	13		1	2	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1	
10954	Perfluorohexanesulfonate	355-46-4	35		4	10	1	
10954	Perfluoro-octanesulfonate	1763-23-1	24		5	10	1	
10954	NETFOSAA	2991-50-6	N.D. VJ		5	8	1	
	NEtFOSAA is the acronym for	N-ethyl perfluoroo	ctanesulfo	namidoaceti	ic Acid.			
10954	NMeFOSAA	2355-31-9	N.D. UJ		4	8	1	
	NMeFOSAA is the acronym for	N-methyl perfluoro	octanesulf	onamidoacet	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 15:35	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: UPA-02S Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619374 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 13:05 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

UPA2S SDG#: DSG01-24

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	60	1	2	1
10954	Perfluorononanoic acid	375-95-1	2	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.UJ	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.UJ	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D. UT	3	5	1
10954	Perfluorohexanoic acid	307-24-4	44	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	21	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	5 J	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ	5	8	1
	NEtFOSAA is the acronym for N-6	thyl perfluorod	octanesulfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D. UJ	4	8	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanesulfonamid	pacetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratorv	Sample	Analvsis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 15:	:48 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16281008	10/10/2016 09	:30 Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: UPA-02D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619375 LL Group # 1715314

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 13:05 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

UPA2D SDG#: DSG01-25

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	3					
10954	Perfluorooctanoic acid	335-67-1	180		1	2	1
10954	Perfluorononanoic acid	375-95-1	9		1	2	1
10954	Perfluorodecanoic acid	335-76-2	3		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	27		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	18		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	34		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	21		5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesulfona	amidoacetio	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D. VJ		4	8	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesulfor	namidoacet:	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 16:00	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-12-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619376 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 15:50 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50 Reported: 11/22/2016 14:19

DDA12 SDG#: DSG01-26

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	230		1	2	1
10954	Perfluorononanoic acid	375-95-1	13		1	2	1
10954	Perfluorodecanoic acid	335-76-2	2	J	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	60		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	34		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	25		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	19		5	10	1
10954	NEtFOSAA	2991-50-6	N.D.		5	8	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesul	fonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	17	4	8	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesu	lfonamidoaceti	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Haboratory	parithre	AHALYSIS	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 16:	12 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:	30 Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: DDA-03 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8619377 LL Group # 1715314 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 09/29/2016 16:05

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 09/30/2016 18:50

Reported: 11/22/2016 14:19

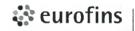
DDA03 SDG#: DSG01-27

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 1	Rev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	600	10	20	10
10954	Perfluorononanoic acid	375-95-1	12	1	2	1
10954	Perfluorodecanoic acid	335-76-2	7	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. UJ	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D. UJ	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D. U.T	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D. VJ	3	5	1
10954	Perfluorohexanoic acid	307-24-4	61	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	48 5-	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	73	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	64	5	10	1
10954	NETFOSAA	2991-50-6	N.D. UJ	5	8	1
	NEtFOSAA is the acronym for N-e	thyl perfluorod	ctanesulfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	4 J	4	8	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamido	pacetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/18/2016 14:46	Jason W Knight	1
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16281008	10/25/2016 13:20	Jason W Knight	10
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16281008	10/10/2016 09:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW-100316 Water

Delaware Sand & Gravel

LL Sample # WW 8635689

Dilution Factor

1

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016

is being reported.

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSGT3 SDG#: DSG02-01TB

CAT No.	Analysis Name		CAS Number	Result		Method Detect:	ion Limit
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	
		modified					
10954	Perfluorooctanoio	cacid	335-67-1	N.D.		1	
10954	Perfluorononanoio	acid	375-95-1	N.D.		1	
10954	Perfluorodecanoio	acid	335-76-2	N.D.		1	
10954	Perfluoroundecand	oic acid	2058-94-8	N.D.		2	
10954	Perfluorododecano	oic acid	307-55-1	N.D.		3	
10954	Perfluorotridecar	noic acid	72629-94-8	N.D.		2	
10954	Perfluorotetradeo	canoic acid	376-06-7	N.D.		3	
10954	Perfluorohexanoio	c acid	307-24-4	N.D.		1	
10954	Perfluoroheptanoi	ic acid	375-85-9	N.D.		1	
10954	Perfluorobutanesu	ılfonate	375-73-5	N.D		4	
10954	Perfluorohexanesu	ılfonate	355-46-4	N.D.		4	
10954	Perfluoro-octanes	sulfonate	1763-23-1	N.D.		5	
10954	NETFOSAA		2991-50-6	N.D.		5	
	NEtFOSAA is the a	acronym for N-	ethyl perfluoro	octanesulfo	namidoacetio	c Acid.	
10954	NMeFOSAA		2355-31-9	N.D.		4	
	NMeFOSAA is the a	acronym for N-	methyl perfluor	ooctanesulf	onamidoacet:	ic Acid.	
The	stated QC limits a	re advisory or	aly until suffic	cient data	points		
can	be obtained to cal	culate statis	tical limits.				
Due	to a sample handli	ng error, the	samples on this	extraction	n batch were		
swit	ched during the ex	traction proce	ess. The sample	es were re-	extracted ou	tside	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

the required hold time. After consulting with the client the re-extracted data

CAT No.	Analysis Name	Method	Tri	ial# Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1 modified	.1 1	16295001	10/25/2016	01:45	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1	.1 2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FDGW-100316 Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635690

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

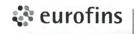
DSGD3 SDG#: DSG02-02FD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	170 丁	1	1
10954	Perfluorononanoic acid	375-95-1	8 J	1	1
10954	Perfluorodecanoic acid	335-76-2	13 T+	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. V 3	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4		1	1
10954	Perfluoroheptanoic acid	375-85-9	26 1	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D. UJ	4	1
10954	Perfluorohexanesulfonate	355-46-4		4	1
10954		1763-23-1		5	1
10954		2991-50-6		5	1
	NEtFOSAA is the acronym for N-e				
10954		2355-31-9	N.D. U J	4	1
	NMeFOSAA is the acronym for N-m			d.	
	stated QC limits are advisory on		ent data points		
	be obtained to calculate statist				
	to a sample handling error, the				
	ched during the extraction proces				
	required hold time. After consu	lting with the o	lient the re-extracted dat	a	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016 02	2:17	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016 13	1:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: UPA-03D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635691

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 11:40 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

DSGU3 SDG#: DSG02-03

CAT No.	Analysis Name		CAS Number	Result		Method Detection	ı Limit	Dil: Fac	ution
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l			
		modified							
10954	Perfluorooctanoic	acid	335-67-1	180 J		1		1	
10954	Perfluorononanoic	acid	375-95-1	8 1+		1		1	
10954	Perfluorodecanoic	acid	335-76-2	13 T+		1		1	
10954	Perfluoroundecano	ic acid	2058-94-8	N.D. UJ		2		1	
10954	Perfluorododecano	ic acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecan	oic acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradec	anoic acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic	acid	307-24-4	51 J		1		1	
10954	Perfluoroheptanoi	c acid	375-85-9	29 T+		1		1	
10954	Perfluorobutanesu	lfonate	375-73-5	N.D. UJ		4		1	
10954	Perfluorohexanesu	lfonate	355-46-4	110 J		4		1	
10954	Perfluoro-octanes	ulfonate	1763-23-1	55 T+		5		1	
10954	NETFOSAA		2991-50-6	N.D. UJ		5		1	
	NEtFOSAA is the a	cronym for N-et	hyl perfluoro	octanesulfonam	idoaceti	c Acid.			
10954	NMeFOSAA		2355-31-9	N.D. VJ		4		1	
	NMeFOSAA is the a	cronym for N-me	thyl perfluor	ooctanesulfona	midoacet	ic Acid.			
The	stated QC limits a:	re advisory onl	y until suffic	cient data poi	nts				
can	be obtained to cal	culate statisti	cal limits.						
Due	to a sample handling	ng error, the s	amples on this	extraction b	atch were	9			
	ched during the ex								
	required hold time	 After consul 	ting with the	client the re	-extracte	ed data			
is b	eing reported.								

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Tim	e	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16295001	10/25/2016	02:50	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW-100316 Water

Delaware Sand & Gravel

LL Sample # WW 8635692 LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 12:06 by CD Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSGF3 SDG#: DSG02-04FB

is being reported.

Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
modified				
Perfluorooctanoic acid	335-67-1	N.D.	1	1
Perfluorononanoic acid	375-95-1	N.D.	1	1
Perfluorodecanoic acid	335-76-2	N.D.	1	1
Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
Perfluorododecanoic acid	307-55-1	N.D.	3	1
Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
Perfluorohexanoic acid	307-24-4	N.D.	1	1
Perfluoroheptanoic acid	375-85-9	N.D.	1	1
Perfluorobutanesulfonate	375-73-5	N.D.	4	1
Perfluorohexanesulfonate	355-46-4	N.D.	4	1
Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
NETFOSAA	2991-50-6	N.D.	5	1
			1.	
			4	1
			d.	
		ient data points		
required hold time. After consul	lting with the	client the re-extracted dat	a	
	Organics EPA 537 R modified Perfluorooctanoic acid Perfluorodecanoic acid Perfluorodecanoic acid Perfluorodecanoic acid Perfluorotridecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorocotanesulfonate Perfluorocotanesulfonate Perfluoronexanosulfonate Perfluoronexanosulfonate NETFOSAA NETFOSAA is the acronym for N-e NMEFOSAA is the acronym for N-m stated QC limits are advisory on be obtained to calculate statist to a sample handling error, the stated during the extraction proces	Organics EPA 537 Rev. 1.1 modified Perfluorooctanoic acid 335-67-1 Perfluorodecanoic acid 375-95-1 Perfluorodecanoic acid 307-59-1 Perfluorododecanoic acid 2058-94-8 Perfluorotridecanoic acid 72629-94-8 Perfluorotetradecanoic acid 307-55-1 Perfluorotetradecanoic acid 376-06-7 Perfluorohexanoic acid 376-06-7 Perfluorohexanoic acid 375-85-9 Perfluorohexanoic acid 375-85-9 Perfluorohexanoic acid 375-73-5 Perfluorocottanesulfonate 355-46-4 Perfluoro-octanesulfonate 1763-23-1 NETFOSAA 2991-50-6 NETFOSAA 2991-50-6 NETFOSAA is the acronym for N-ethyl perfluoroc NMeFOSAA 2355-31-9 NMeFOSAA is the acronym for N-methyl perfluoroc stated QC limits are advisory only until suffic be obtained to calculate statistical limits. to a sample handling error, the samples on this sched during the extraction process. The sample	Organics EPA 537 Rev. 1.1 ng/l modified Perfluorooctanoic acid 335-67-1 N.D. Perfluorodecanoic acid 375-95-1 N.D. Perfluorodecanoic acid 2058-94-8 N.D. Perfluorododecanoic acid 307-55-1 N.D. Perfluorotridecanoic acid 72629-94-8 N.D. Perfluorotetradecanoic acid 376-06-7 N.D. Perfluorotetradecanoic acid 376-06-7 N.D. Perfluorohexanoic acid 307-24-4 N.D. Perfluorobetanoic acid 375-85-9 N.D. Perfluorobetanoic acid 375-85-9 N.D. Perfluorocotanesulfonate 375-73-5 N.D. Perfluoro-octanesulfonate 355-46-4 N.D. Perfluoro-octanesulfonate 1763-23-1 N.D. NETFOSAA 2991-50-6 N.D. NETFOSAA 2991-50-6 N.D. NMEFOSAA 2355-31-9 N.D. NMEFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid NMEFOSAA 2355-31-9 N.D. NMEFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid Stated QC limits are advisory only until sufficient data points be obtained to calculate statistical limits. to a sample handling error, the samples on this extraction batch were cohed during the extraction process. The samples were re-extracted outside	Analysis Name CAS Number Result Detection Limit Organics EPA 537 Rev. 1.1 ng/l ng/l Perfluoroscanoic acid 335-67-1 N.D. 1 Perfluorononanoic acid 375-95-1 N.D. 1 Perfluorodecanoic acid 335-76-2 N.D. 1 Perfluoroundecanoic acid 2058-94-8 N.D. 2 Perfluorodecanoic acid 307-55-1 N.D. 3 Perfluorotetradecanoic acid 72629-94-8 N.D. 2 Perfluorotetradecanoic acid 376-06-7 N.D. 3 Perfluorotexanoic acid 376-06-7 N.D. 3 Perfluorohexanoic acid 375-24-4 N.D. 1 Perfluorobexanoic acid 375-85-9 N.D. 1 Perfluorobexanoic acid 375-73-5 N.D. 4 Perfluorobexanoic acid 375-73-5 N.D. 4 Perfluorobexanoic acid 375-73-5 N.D. 4 Perfluorobexanoic acid 375-73-5 N.D. 5

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016	03:56	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-26N Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635693

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 12:10 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

DSG26 SDG#: DSG02-05BKG

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Diluti Factor	
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l		
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	87 J		1	1	
10954	Perfluorononanoic acid	375-95-1	4 J+		1	1	
10954	Perfluorodecanoic acid	335-76-2	1 8	J+	1	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D. VJ		2	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	1	
10954	Perfluorohexanoic acid	307-24-4	20 🕇		1	1	
10954	Perfluoroheptanoic acid	375-85-9	11 J+		1	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D. V		4	1	
10954	Perfluorohexanesulfonate	355-46-4	17 J		4	1	
10954	Perfluoro-octanesulfonate	1763-23-1	11 14		5	1	
10954	NETFOSAA	2991-50-6	N.D.	7	5	1	
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfor	namidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D. UJ	•	4	1	
	NMeFOSAA is the acronym for	N-methyl perfluor	octanesulfo	namidoaceti	c Acid.		
The	stated QC limits are advisory	only until suffic	ient data p	oints			
can	be obtained to calculate stati	istical limits.					
Due	to a sample handling error, the	ne samples on this	extraction	batch were			
swit	ched during the extraction pro	ocess. The sample	s were re-e	xtracted out	tside		
	required hold time. After cor eing reported.	nsulting with the	client the	re-extracted	d data		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/24/2016	23:17	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-26NMS Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635694 LL Group # 1718978

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 12:10 by CD Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

DSG26 SDG#: DSG02-05MS

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	270	1	1
10954	Perfluorononanoic acid	375-95-1	180	1	1
10954	Perfluorodecanoic acid	335-76-2	190	1	1
10954	Perfluoroundecanoic acid	2058-94-8	190	2	1
10954	Perfluorododecanoic acid	307-55-1	210	3	1
10954	Perfluorotridecanoic acid	72629-94-8	200	2	1
10954	Perfluorotetradecanoic acid	376-06-7	210	3	1
10954	Perfluorohexanoic acid	307-24-4	210	1	1
10954	Perfluoroheptanoic acid	375-85-9	160	1	1
10954	Perfluorobutanesulfonate	375-73-5	150	4	1
10954	Perfluorohexanesulfonate	355-46-4	210	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	190	5	1
10954	NEtFOSAA	2991-50-6	180	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Aci	d.	
10954	NMeFOSAA	2355-31-9	230	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Ac	id.	
The	stated QC limits are advisory on	ly until suffic	ient data points		
can	be obtained to calculate statist	ical limits.			
	to a sample handling error, the				
swit	ched during the extraction proce	ss. The sample	s were re-extracted outside	2	
	required hold time. After consu	lting with the	client the re-extracted dat	ta	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

- 1			
Laboratory	Sample	Analvsis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) BPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/24/2016	23:50	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-26NMSD Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635695 LL Group # 1718978

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 12:10

Golder Associates Incorporated

200 Century Parkway

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

DSG26 SDG#: DSG02-05MSD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
Misc.	Organics EPA 53	37 Rev. 1.1	ng/l		ng/l	
	modif:	led				
10954	Perfluorooctanoic acid	335-67-1	250		1	1
10954	Perfluorononanoic acid	375-95-1	170		1	1
10954	Perfluorodecanoic acid	335-76-2	170		1	1
10954	Perfluoroundecanoic acid	2058-94-8	180		2	1
10954	Perfluorododecanoic acid	307-55-1	190		3	1
10954	Perfluorotridecanoic acid	72629-94-8	180		2	1
10954	Perfluorotetradecanoic acid	376-06-7	200		3	1
10954	Perfluorohexanoic acid	307-24-4	220		1	1
10954	Perfluoroheptanoic acid	375-85-9	160		1	1
10954	Perfluorobutanesulfonate	375-73-5	140		4	1
10954	Perfluorohexanesulfonate	355-46-4	200		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	180		5	1
10954	NETFOSAA	2991-50-6	170		5	1
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfo	namidoaceti	c Acid.	
10954	NMeFOSAA	2355-31-9	220		4	1
	NMeFOSAA is the acronym for	N-methyl perfluore	octanesulf	onamidoacet	ic Acid.	
The	stated QC limits are advisor	y only until suffic	ient data	points		

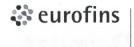
can be obtained to calculate statistical limits.

Due to a sample handling error, the samples on this extraction batch were switched during the extraction process. The samples were re-extracted outside the required hold time. After consulting with the client the re-extracted data is being reported.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16295001	10/25/2016	00:56	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DGC-11D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635696 LL Group # 1718978

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 14:40 by CD Golder Associates Incorporated

200 Century Parkway

Suite C

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

Mt. Laurel NJ 08054

GC11D SDG#: DSG02-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified		-		
10954	Perfluorooctanoic acid	335-67-1	43 T+	1	1
10954	Perfluorononanoic acid	375-95-1	13 🎳	1	1
10954	Perfluorodecanoic acid	335-76-2	3 J	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. V 5	2	1
10954		307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954		376-06-7	N.D. 1	3	1
10954		307-24-4	22 🏅	1	1
10954	Perfluoroheptanoic acid	375-85-9	12 J.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D. UT	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	7 854	5	1
10954		2991-50-6	и.D. 3 5	5	1
	NEtFOSAA is the acronym for N-e				
10954		2355-31-9	N.D. UJ	4	1
	NMeFOSAA is the acronym for N-m			d.	
	stated QC limits are advisory on:		ent data points		
	be obtained to calculate statist:				
	to a sample handling error, the s				
	ched during the extraction proces				
	required hold time. After consu	lting with the c	lient the re-extracted data	a	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir		Analyst	Dilution Factor
NO.					Date and III	ile		FACTOL
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1	1	16295001	10/25/2016	04:29	Marissa C	1
		modified					Drexinger	
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DGC-11S Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635697

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/03/2016 14:55 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

GC11S SDG#: DSG02-07

is being reported.

No.	Analysis Name		CAS Number	Result			Method Detection L	imit	Dilution Factor	1	
Misc.	Organics 1	EPA 537 R	ev. 1.1	ng/l			ng/l				
	1	modified									
10954	Perfluorooctanoic act	id	335-67-1	N.D. UJ			1		1		
10954	Perfluorononanoic aci	id	375-95-1	N.D.			1		1		
10954	Perfluorodecanoic ac	id	335-76-2	N.D.			1		1		
10954	Perfluoroundecanoic a	acid	2058-94-8	N.D.			2		1		
10954	Perfluorododecanoic a	acid	307-55-1	N.D.			3		1		
10954	Perfluorotridecanoic	acid	72629-94-8	N.D.			2		1		
10954	Perfluorotetradecano	ic acid	376-06-7	N.D.			3		1		
10954	Perfluorohexanoic ac		307-24-4	N.D.			1		1		
10954	Perfluoroheptanoic ad		375-85-9	N.D.			1		1		
10954	Perfluorobutanesulfor		375-73-5	N.D.			4		1		
10954	Perfluorohexanesulfor		355-46-4	N.D.			4		1		
10954	Perfluoro-octanesulfo	onate	1763-23-1	N.D.			5		1		
10954	NETFOSAA		2991-50-6	N.D.			5		1		
	NEtFOSAA is the acros	nym for N-et				c Acid.					
10954	NMeFOSAA		2355-31-9	N.D. UJ			4		1		
	NMeFOSAA is the acros					ic Acid					
	stated QC limits are a			cient data po	oints						
	be obtained to calcula										
	to a sample handling e										
	ched during the extrac										
the	required hold time. A	iter consul	ting with the	client the r	re-extracte	ed data					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev modified	. 1.1	1	16295001	10/25/2016	05:01	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev modified	. 1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW-100416 Water

Delaware Sand & Gravel

LL Sample # WW 8635698 LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/04/2016

Golder Associates Incorporated

200 Century Parkway

Suite C

Builte C

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

Mt. Laurel NJ 08054

DSGT4 SDG#: DSG02-08TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l	ng/l	
	modif	ied			
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954		2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for	N-ethyl perfluoroo	ctanesulfonamid	oacetic Acid.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for				
The	stated QC limits are advisor	y only until suffici	ient data points	3	
can	be obtained to calculate sta	tistical limits.			
	to a sample handling error,				
swit	ched during the extraction p	rocess. The samples	were re-extrac	cted outside	
	required hold time. After c	onsulting with the o	client the re-ex	ctracted data	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016 05:18	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016 11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW-100416 Water

Delaware Sand & Gravel

LL Sample # WW 8635699

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/04/2016 12:33 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

DSGF4 SDG#: DSG02-09FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection L	imit	Dilution Factor
Misc.	Organics EPA !	537 Rev. 1.1	ng/l		ng/l		
	modi	fied					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1		1
10954	Perfluorononanoic acid	375-95-1	N.D.		1		1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1		1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2		1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3		1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2		1
10954	Perfluorotetradecanoic aci	.d 376-06-7	N.D.		3		1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1		1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1		1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4		1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4		1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5		1
10954	NEtFOSAA	2991-50-6	N.D.		5		1
	NEtFOSAA is the acronym fo	or N-ethyl perfluoroo	ctanesulfo	namidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4		1
	NMeFOSAA is the acronym fo	r N-methyl perfluoro	octanesulf	onamidoacet	ic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

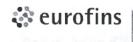
Due to a sample handling error, the samples on this extraction batch were switched during the extraction process. The samples were re-extracted outside the required hold time. After consulting with the client the re-extracted data

is being reported.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016 06:23	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016 11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: BW-2 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635700 LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/04/2016 12:50

Golder Associates Incorporated

200 Century Parkway

Suite C

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

Mt. Laurel NJ 08054

DSGB2 SDG#: DSG02-10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA	537 Rev. 1.1	ng/l	ng/l	
	modi	.fied			
10954	Perfluorooctanoic acid	335-67-1	83 5	1	1
10954	Perfluorononanoic acid	375-95-1	9 👅	1	1
10954	Perfluorodecanoic acid	335-76-2	2 J	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. UJ	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	, , , , , , , , ,	N.D.	2	1
10954	Perfluorotetradecanoic ad	id 376-06-7	N.D.	3	1
10954		307-24-4	20 5	1	1
10954	Perfluoroheptanoic acid	375-85-9	13 J	1	1
10954	Perfluorobutanesulfonate	375-73-5		4	1
10954		355-46-4	11 T	4	1
10954			17 5	5	1
10954	NETFOSAA	2991-50-6	N.D. UJ		1
	NEtFOSAA is the acronym f		tanesulfonar	midoacetic Acid.	
10954		2355-31-9	N.D. UJ	4	1
	NMeFOSAA is the acronym f				
	stated QC limits are advis		ent data poi	nts	
	be obtained to calculate s				
	to a sample handling error				
	ched during the extraction				
	required hold time. After	consulting with the c	lient the re	e-extracted data	
1s b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016 06	:40 Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016 11	:30 Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: BW-1 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635701 LL Group # 1718978

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/04/2016 13:35 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSGB1 SDG#: DSG02-11

CAT No.	Analysis Name		CAS Number	Result		Method Detection	Limit	Dilution Factor	1
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l			
		modified							
10954	Perfluorooctanoic ac	id	335-67-1	130 🍑		1		1	
10954	Perfluorononanoic ac	id	375-95-1	10 J+		1		1	
10954	Perfluorodecanoic ac	id	335-76-2	N.D. VJ		1		1	
10954	Perfluoroundecanoic	acid	2058-94-8	N.D.		2		1	
10954	Perfluorododecanoic	acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecanoio	acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradecand	ic acid	376-06-7	N.D. 👃		3		1	
10954	Perfluorohexanoic ac	id:	307-24-4	25 J		1		1	
10954	Perfluoroheptanoic a	cid	375-85-9	16 J		1		1	
10954	Perfluorobutanesulfo	onate	375-73-5	N.D. UJ		4		1	
10954	Perfluorohexanesulfo	nate	355~46~4	16 T		4		1	
10954	Perfluoro-octanesulf	onate	1763-23-1	18 T +		5		1	
10954	NETFOSAA		2991-50-6	N.D. UT		5		1	
	NEtFOSAA is the acro	onym for N-e	thyl perfluorod	octanesulfona	midoacetic	Acid.			
10954	NMeFOSAA		2355-31-9	N.D. JJ		4		1	
	NMeFOSAA is the acro					c Acid.			
	stated QC limits are			ient data po	ints				
can	be obtained to calcul	ate statisti	cal limits.						

can be obtained to calculate statistical limits.

Due to a sample handling error, the samples on this extraction batch were switched during the extraction process. The samples were re-extracted outside the required hold time. After consulting with the client the re-extracted data is being reported.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16295001	10/25/2016	06:56	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW-100516 Water

Delaware Sand & Gravel

LL Sample # WW 8635702 LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

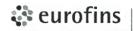
DSGT5 SDG#: DSG02-12TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NEtFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluorood	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m			d.	
	stated QC limits are advisory on		ent data points		
	be obtained to calculate statist				
	to a sample handling error, the				
	ched during the extraction proces				
	required hold time. After consu	lting with the o	lient the re-extracted data	à	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	1	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016 0	7:13	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016 1	1:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW-100516 Water

Delaware Sand & Gravel

LL Sample # WW 8635703

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 10:00 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSGF5 SDG#: DSG02-13FB

CAT No.	Analysis Name		CAS Number	Result		Method Detection	Limit	Dilution Factor	
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l			
		modified							
10954	Perfluorooctanoic	acid	335-67-1	N.D.		1		1	
10954	Perfluorononanoic	acid	375-95-1	N.D.		1		1	
10954	Perfluorodecanoic	acid	335-76-2	N.D.		1		1	
10954	Perfluoroundecanoi	c acid	2058-94-8	N.D.		2		1	
10954	Perfluorododecanoi	c acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecand	ic acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradeca	noic acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic	acid	307-24-4	N.D.		1		1	
10954	Perfluoroheptanoio		375-85-9	N.D.		1		1	
10954	Perfluorobutanesul	fonate.	375-73-5	N.D.		4		1	
10954	Perfluorohexanesul		355-46-4	N.D.		4		1	
10954	Perfluoro-octanesu	lfonate	1763-23-1	N.D.		5		1	
10954	NEtFOSAA		2991-50-6	N.D.		5		1	
	NEtFOSAA is the ac	ronym for N-6		octanesulfo:	namidoacetic	Acid.			
10954	NMeFOSAA		2355-31-9	N.D.		4		1	
	NMeFOSAA is the ac					Acid.			
	stated QC limits ar			cient data p	ooints				
	be obtained to calc								
	to a sample handlin								
	ched during the ext								
	required hold time.	After consu	lting with the	client the	re-extracted	data			
is b	eing reported.								

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16295001	10/25/2016 08:18	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev.	1.1	2	16295001	10/21/2016 11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DDA-10-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635704 LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 10:40 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSGDD SDG#: DSG02-14

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	
	modified	l			
10954	Perfluorooctanoic acid	335-67-1	180 🏅	1	1
10954	Perfluorononanoic acid	375-95-1	7 T	1	1
10954	Perfluorodecanoic acid	335-76-2	2 J	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. UJ	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7		3	1
10954	Perfluorohexanoic acid	307-24-4		1	1
10954	Perfluoroheptanoic acid	375-85-9		1	1
10954	Perfluorobutanesulfonate	375-73-5		4	1
10954	Perfluorohexanesulfonate	355-46-4		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	16 J+	5	1
10954		2991-50-6		5	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	octanesulfonamidoac	cetic Acid.	
10954	NMeFOSAA	2355-31-9	N.D. UJ	4	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesulfonamidoa	acetic Acid.	
The	stated QC limits are advisory or	nly until suffic	ient data points		
can	be obtained to calculate statis	tical limits.			
	to a sample handling error, the				
swit	ched during the extraction proc	ess. The sample	s were re-extracte	ed outside	
	required hold time. After cons	ulting with the	client the re-extr	acted data	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Habor acor y	Dampie	THILD T Y D T D	TOUCHU

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016	08:35	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FDGW-100516 Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635705

LL Group # 1718978 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 12/12/2016 14:22

DSGD5 SDG#: DSG02-15FD

CAT No.	Analysis Name		CAS Number	Result		Method Detection	Limit	Dilution Factor	a Squitt
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l			
		modified							
10954	Perfluorooctanoic	acid	335-67-1	130 J		1		1	
10954	Perfluorononanoic	acid	375-95-1	9 🕇		1		1	
10954	Perfluorodecanoic	acid	335-76-2	2 3	9	1		1	
10954	Perfluoroundecano:	ic acid	2058-94-8	N.D. UT		2		1	
10954	Perfluorododecano:	ic acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecand	oic acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradeca	anoic acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic	acid	307-24-4	30 🕇		1		1	
10954	Perfluoroheptanoio	c acid	375-85-9	19		1		1	
10954	Perfluorobutanesu:	lfonate	375-73-5	N.D. UJ		4		1	
10954	Perfluorohexanesu:	lfonate	355-46-4	10 J		4		1	
10954	Perfluoro-octanes	ulfonate	1763-23-1	120 J		5		1	
10954	NETFOSAA		2991-50-6	N.D. UJ		5		1	
	NEtFOSAA is the ac	cronym for N-	ethyl perfluorod	octanesulfor	amidoaceti	c Acid.			
10954	NMeFOSAA		2355-31-9	N.D. UJ	TO THE	4		1	
	NMeFOSAA is the ac	cronym for N-	methyl perfluoro	octanesulfo	namidoacet	ic Acid.			
The	stated QC limits ar	e advisory or	ly until suffic	ient data p	oints				
can	be obtained to calc	ulate statist	ical limits.	-					
Due	to a sample handling	g error, the	samples on this	extraction	batch were	2			
swit	ched during the ext	raction proce	ess. The sample	s were re-e	xtracted ou	utside			
the	required hold time.	After consu	lting with the	client the	re-extracte	ed data			
is b	eing reported.		-						

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Remodified	ev. 1.1	1	16295001	10/25/2016 08:51	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Remodified	ev. 1.1	2	16295001	10/21/2016 11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-29 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635706 LL Group # 1718978

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 12:00 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 12/12/2016 14:22

DSG29 SDG#: DSG02-16

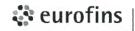
CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 I	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	120 T	1	1
10954	Perfluorononanoic acid	375-95-1	9 🏅	1	1
10954	Perfluorodecanoic acid	335-76-2	2 J	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D. VJ	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7		3	1
10954	Perfluorohexanoic acid	307-24-4		1	1
10954		375-85-9	19 J	1	1
10954		375-73-5		4	1
10954		355-46-4		4	1
10954	Perfluoro-octanesulfonate	1763-23-1		5	1
10954		2991-50-6		5	1
	NEtFOSAA is the acronym for N-6	thyl perfluoroo	ctanesulfonamidoacetic Acid	d	
10954		2355-31-9	N.D. VJ	4	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanesulfonamidoacetic Ac	id.	
	stated QC limits are advisory on		ient data points		
	be obtained to calculate statist				
	to a sample handling error, the				
swit	ched during the extraction proce	ss. The sample	s were re-extracted outside		
	required hold time. After consu	lting with the	client the re-extracted dat	a	
is b	eing reported.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Laborator y	Dampte	VIIGTABLE	VECOTA

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295001	10/25/2016	09:07	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	2	16295001	10/21/2016	11:30	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-31 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635707

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 12:25 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 10/26/2016 15:09

DSG31 SDG#: DSG03-01BKG

Misc.			CAS Number	Result		Method Detectio	n Limit		lution	
	Organics	EPA 537	Rev. 1.1	ng/l		ng/l				
		modified	đ							
10954	Perfluorooctanoic	acid	335-67-1	190 J-		1		1		
10954	Perfluorononanoic	acid	375-95-1	6		1		1		
10954	Perfluorodecanoic	acid	335-76-2	N.D.		1		1		
10954	Perfluoroundecanoi	c acid	2058-94-8	N.D.		2		1		
10954	Perfluorododecanoi	c acid	307-55-1	N.D.VJ		3		1		
10954	Perfluorotridecano	ic acid	72629-94-8	N.D. UJ		2		1		
10954	Perfluorotetradeca	noic acid	376-06-7	N.D. UJ		3		1		
10954	Perfluorohexanoic	acid	307-24-4	40 J-		1		1		
10954	Perfluoroheptanoio	acid	375-85-9	28		1		1		
10954	Perfluorobutanesul	fonate	375-73-5	4 J		4		1		
10954	Perfluorohexanesul	fonate	355-46-4	10		4		1		
10954	Perfluoro-octanesu	lfonate	1763-23-1	100		5		1		
10954	NETFOSAA		2991-50-6	25		5		1		
	NEtFOSAA is the ac	ronym for N	ethyl perfluoro	octanesulfo	namidoacet:	ic Acid.				
10954	NMeFOSAA		2355-31-9	N.D.		4		1		
	NMeFOSAA is the ac	ronym for N	methyl perfluor	octanesulf	onamidoacet	tic Acid.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16288004	10/21/2016	01:25	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev.	1.1	1	16288004	10/17/2016	12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-31MS Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635708 LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 12:25 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

DSG31 SDG#: DSG03-01MS

Submitted: 10/07/2016 18:05

Reported: 10/26/2016 15:09

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	360	1	1
10954	Perfluorononanoic acid	375-95-1	180	1	1
10954	Perfluorodecanoic acid	335-76-2	150	1	1
10954	Perfluoroundecanoic acid	2058-94-8	180	2	1
10954	Perfluorododecanoic acid	307-55-1	170	3	1
10954	Perfluorotridecanoic acid	72629-94-8	240	2	1
10954	Perfluorotetradecanoic acid	376-06-7	240	3	1
10954	Perfluorohexanoic acid	307-24-4	220	1	1
10954	Perfluoroheptanoic acid	375-85-9	190	1	1
10954	Perfluorobutanesulfonate	375-73-5	170	4	1
10954	Perfluorohexanesulfonate	355-46-4	180	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	270	5	1
10954	NEtFOSAA	2991-50-6	200	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid	1.	
10954	NMeFOSAA	2355-31-9	220	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Ac	id.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
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CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	e	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016	01:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016	12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-31MSD Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635709

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 12:25 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 10/26/2016 15:09

DSG31 SDG#: DSG03-01MSD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
Misc.	Organics EPA !	537 Rev. 1.1	ng/l		ng/l	
	modi	fied				
10954	Perfluorooctanoic acid	335-67-1	350		1	1
10954	Perfluorononanoic acid	375-95-1	170		1	1
10954	Perfluorodecanoic acid	335-76-2	150		1	1
10954	Perfluoroundecanoic acid	2058-94-8	190		2	1
10954	Perfluorododecanoic acid	307-55-1	180		3	1
10954	Perfluorotridecanoic acid	72629-94-8	220		2	1
10954	Perfluorotetradecanoic aci	ld 376-06-7	200		3	0 = 0 h1 = 10 m;
10954	Perfluorohexanoic acid	307-24-4	220		1	1
10954	Perfluoroheptanoic acid	375-85-9	180		1	1
10954	Perfluorobutanesulfonate	375-73-5	190		4	1
10954	Perfluorohexanesulfonate	355-46-4	200		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	280		5	1
10954	NETFOSAA	2991-50-6	200		5	1
	NEtFOSAA is the acronym fo	or N-ethyl perfluorod	octanesulfor	namidoaceti	c Acid.	
10954	NMeFOSAA	2355-31-9	220		4	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 01:57	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: RT-1UP Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635710

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 15:15 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

DSG1U SDG#: DSG03-02

Submitted: 10/07/2016 18:05

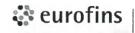
Reported: 10/26/2016 15:09

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	2	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	3	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluorod	octanesulfonamidoac	etic Acid.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-π	ethyl perfluoro	octanesulfonamidoa	cetic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016	03:03	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016	12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-28 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635711

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/05/2016 15:40 by CD Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSG28 SDG#: DSG03-03

No.	Analysis Name	CAS Number	Result	:		Method Detection L	imit	Dilution Factor	on	
Misc.		537 Rev. 1.1	ng/l			ng/l				
	mod	ified								
10954	Perfluorooctanoic acid	335-67-1	54			1		1		
10954	Perfluorononanoic acid	375-95-1	3 J+			1		1		
10954	Perfluorodecanoic acid	335-76-2	N.D.			1		1		
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2		1		
10954	Perfluorododecanoic acid	307-55-1	N.D.			3		1		
10954	Perfluorotridecanoic aci	d 72629-94-8	N.D.			2		1		
10954	Perfluorotetradecanoic a	cid 376-06-7	N.D.			3		1		
10954	Perfluorohexanoic acid	307-24-4	40			1		1		
10954	Perfluoroheptanoic acid	375-85-9	23			1		1		
10954	Perfluorobutanesulfonate	375-73-5	6	J		4		1		
10954	Perfluorohexanesulfonate	355-46-4	8	J		4		1		
10954	Perfluoro-octanesulfonat	e 1763-23-1	9	J		5		1		
10954	NETFOSAA	2991-50-6	N.D.			5		1		
	NEtFOSAA is the acronym	for N-ethyl perfluoro	ctanesul	fona	midoaceti	ic Acid.				
10954	NMeFOSAA	2355-31-9	N.D.			4		1		
	NMeFOSAA is the acronym	for N-methyl perfluore	octanesi	lfon	amidoacet	tic Acid				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 03:19	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW-100616 Water

Delaware Sand & Gravel

LL Sample # WW 8635712 LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSGT6 SDG#: DSG03-04TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluorod	ctanesulfonamidoacetic	Acid.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoaceti	.c Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 03:36	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW-100616 Water

Delaware Sand & Gravel

LL Sample # WW 8635713 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 09:10 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

DSGF6 SDG#: DSG03-05FB

Submitted: 10/07/2016 18:05

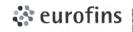
Reported: 10/26/2016 15:09

No.	Analysis Name		AS Number	Result		Method Detection	Limit	Diluti Factor	
Misc.	Organics EP	A 537 Rev	. 1.1	ng/l		ng/l			
	mo	dified							
10954	Perfluorooctanoic acid	3	35-67-1	N.D.		1		1	
10954	Perfluorononanoic acid	3	75-95-1	N.D.		1		1	
10954	Perfluorodecanoic acid	3	35-76-2	N.D.		1		1	
10954	Perfluoroundecanoic ac:	id 2	058-94-8	N.D.		2		1	
10954	Perfluorododecanoic ac:	id 3	07-55-1	N.D.		3		1	
10954	Perfluorotridecanoic ad	cid 7	2629-94-8	N.D.		2		1	
10954	Perfluorotetradecanoic	acid 3	76-06-7	N.D.		3		1	
10954	Perfluorohexanoic acid	3	07-24-4	N.D.		1		1	
10954	Perfluoroheptanoic acid	d 3	75-85-9	N.D.		1		1	
10954	Perfluorobutanesulfona	te 3	75-73-5	N.D.		4		1	
10954	Perfluorohexanesulfona	te 3	55-46-4	N.D.		4		1	
10954	Perfluoro-octanesulfona	ate 1	763-23-1	N.D.		5		1	
10954	NEtFOSAA	2	991-50-6	N.D.		5		1	
	NEtFOSAA is the acrony	m for N-ethy	l perfluoro	octanesulfon	amidoacetio	c Acid.			
10954	NMeFOSAA	2	355-31-9	N.D.		4		1	
	NMeFOSAA is the acrony	m for N-meth	yl perfluor	ooctanesulfo	namidoacet:	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev modified	1.1	1	16288004	10/21/2016 03	:52 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev	1.1	1	16288004	10/17/2016 12	:10 Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DGC-8D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635714

LL Group # 1718979 Account

05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 11:05

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

SDG#: DSG03-06 DSG8D

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	49	1	1
10954	Perfluorononanoic acid	375-95-1	3 T+	1	1
10954	Perfluorodecanoic acid	335-76-2	1 8 5 +	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	13	1	1
10954	Perfluoroheptanoic acid	375-85-9	8	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	17	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	12	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesulfonamidoacetic Aci	d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

modified

2 23 17

	Laboratory Sample Analysis Record								
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor		
	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 04:09	Jason W Knight	1		
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16288004	10/17/2016 12:10	Devon M Whooley	1		



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DGC-8S Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635715 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 11:40 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSG8S SDG#: DSG03-07

CAT	Analysis Name	CAS Number	Result		Method Detection Li	Dilution nit Factor
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l		ng/l	
6	modif	ied				
10954	Perfluorooctanoic acid	335-67-1	34		1	1
10954	Perfluorononanoic acid	375-95-1	5		1	1
10954	Perfluorodecanoic acid	335-76-2	2		1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	1
10954	Perfluorotetradecanoic acid	l 376-06-7	N.D.		3	1
10954	Perfluorohexanoic acid	307-24-4	31 T-		1	1
10954	Perfluoroheptanoic acid	375-85-9	8		1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	1
10954	NETFOSAA	2991-50-6	N.D.		5	1
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfo	namidoacetio	Acid.	
10954	NMeFOSAA	2355-31-9	N.D.		4	1
	NMeFOSAA is the acronym for	N-methyl perfluore	octanesulf	onamidoacet:	ic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 R modified	ev. 1.1	1	16288004	10/21/2016	04:25	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 R	ev. 1.1	1	16288004	10/17/2016	12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MHW-1D Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635716 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 15:15 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSG1D SDG#: DSG03-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	280	1	1
10954	Perfluorononanoic acid	375-95-1	13 J+	1	1
10954	Perfluorodecanoic acid	335-76-2	2	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	40	1	1
10954	Perfluoroheptanoic acid	375-85-9	31	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	14	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	16	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid	l.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Aci	.d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 04:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DDA-15-US Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635717

LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 15:35 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 10/26/2016 15:09

DSG15	SDG#:	DSG03-	09

No.	Analysis Name	CAS Number	Result		Method Detection	n Limit	Dilution Factor	h-sland	
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l				
	modifi	ed							
10954	Perfluorooctanoic acid	335-67-1	200		1		1		
10954	Perfluorononanoic acid	375-95-1	5 Jt		1		1		
10954	Perfluorodecanoic acid	335-76-2	1 1	丁十	1		1		
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2		1		
10954	Perfluorododecanoic acid	307-55-1	N.D.		3		1		
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2		1		
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3		1		
10954	Perfluorohexanoic acid	307-24-4	21		1		1 2000		
10954	Perfluoroheptanoic acid	375-85-9	17		1		1		
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4		1		
10954	Perfluorohexanesulfonate	355-46-4	26		4		1		
10954	Perfluoro-octanesulfonate	1763-23-1	22		5		1		
10954	NEtFOSAA	2991-50-6	N.D.		5		1		
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfor	namidoaceti	c Acid.				
10954	NMeFOSAA	2355-31-9	N.D.		4		1		
	NMeFOSAA is the acronym for	N-methyl perfluore	octanesulfo	namidoacet:	ic Acid.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 04:58	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: UPA-01 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635718 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/06/2016 16:00 by C

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSGP1 SDG#: DSG03-10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	120	1	1
10954	Perfluorononanoic acid	375-95-1	6	1	1
10954	Perfluorodecanoic acid	335-76-2	5	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	38 T –	1	1
10954	Perfluoroheptanoic acid	375-85-9	23	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	52	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	29	5	1
10954	NETFOSAA	29 91-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacetic Acid	i.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 05:	14 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:	10 Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW-100716 Water

Delaware Sand & Gravel

LL Sample # WW 8635719

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSGT7 SDG#: DSG03-11TB

No.	Analysis Name		CAS Number	Result		Method Detection	Limit	Dilut	
Misc.	Organics E	PA 537 1	Rev. 1.1	ng/l		ng/l			
	m	odified							
10954	Perfluorooctanoic aci	d	335-67-1	N.D.		1		1	
10954	Perfluorononanoic aci	d	375-95-1	N.D.		1		1	
10954	Perfluorodecanoic aci	d	335-76-2	N.D.		1		1	
10954	Perfluoroundecanoic a	cid	2058-94-8	N.D.		2		1	
10954	Perfluorododecanoic a	cid	307-55-1	N.D.		3		1	
10954	Perfluorotridecanoic	acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradecanoi	c acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic aci	d	307-24-4	N.D.		1		1	
10954	Perfluoroheptanoic ac	id	375-85-9	N.D.		1		1	
10954	Perfluorobutanesulfon	ate	375-73-5	N.D.		4		1	
10954	Perfluorohexanesulfon	ate	355-46-4	N.D.		4		1	
10954	Perfluoro-octanesulfo	nate	1763-23-1	N.D.		5		1	
10954	NETFOSAA		2991-50-6	N.D.		5		1	
	NEtFOSAA is the acron	ym for N-6	thyl perfluoro	octanesulfor	namidoaceti	c Acid.			
10954	NMeFOSAA		2355-31-9	N.D.		4		1	
	NMeFOSAA is the acron	ym for N-n	methyl perfluor	ooctanesulfo	onamidoacet	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 F modified	lev. 1.1	. 1	16288004	10/21/2016	05:31	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 F	Rev. 1.1	. 1	16288004	10/17/2016	12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW-100716 Water

Delaware Sand & Gravel

LL Sample # WW 8635720 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016 11:41 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSGF7 SDG#: DSG03-12FB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NEtFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	tanesulfonamidoacetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoroo	octanesulfonamidoacetic Acid	1.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 06:36	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-18 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635721

LL Group # 1718979 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016 11:55 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSG18 SDG#: DSG03-13

CAT No.	Analysis Name		CAS Number	Result		Method Detection	Limit	Dil:	ution	
Misc.	Organics	EPA 537	A 537 Rev. 1.1			ng/l				
		modified								
10954	Perfluorooctanoic	acid	335-67-1	150 J-		1		1		
10954	Perfluorononanoic	acid	375-95-1	6		1		1		
10954	Perfluorodecanoic	acid	335-76-2	2 ј		1		1		
10954	Perfluoroundecanoi	c acid	2058-94-8	N.D.		2		1		
10954	Perfluorododecanoi	.c acid	307-55-1	N.D.		3		1		
10954	Perfluorotridecano	ic acid	72629-94-8	N.D.		2		1		
10954	Perfluorotetradeca	noic acid	376-06-7	N.D.		3		1		
10954	Perfluorohexanoic	acid	307-24-4	28 T-		1		1		
10954	Perfluoroheptanoic	acid	375-85-9	20		1		1		
10954	Perfluorobutanesul	fonate	375-73-5	N.D.		4		1		
10954	Perfluorohexanesul	fonate	355-46-4	25		4		1		
10954	Perfluoro-octanesu	lfonate	1763-23-1	47		5		1		
10954	NETFOSAA		2991-50-6	N.D.		5		1		
	NEtFOSAA is the ac	ronym for N-e	ethyl perfluoro	octanesulfon	amidoaceti	c Acid.				
10954	NMeFOSAA	-	2355-31-9	N.D.		4		1		
	NMeFOSAA is the ac	ronvm for N-r	methyl perfluor	octanesulfo	namidoacet	ic Acid.				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1 1	16288004	10/21/2016 06:52	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1 1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-34 Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635722 LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016 12:45 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

DSG34 SDG#: DSG03-14

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	66	1	1
10954	Perfluorononanoic acid	375-95-1	5	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	18	1	1
10954	Perfluoroheptanoic acid	375-85-9	10	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	14	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	14	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesulfonamido	pacetic Acid.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-	methyl perfluor	ooctanesulfonamid	doacetic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 07:09	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: P-5L (UPA) Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635723

LL Group # 1718979

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016 14:25 by CI

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05

Reported: 10/26/2016 15:09

DSG5L SDG#: DSG03-15

	CAS Number	Result	- In		Metho Detec	d tion Limit	Dilution Factor
rganics EPA 5	37 Rev. 1.1	ng/l			ng/l		
modif	ied						
erfluorooctanoic acid	335-67-1	35			1		1
erfluorononanoic acid	375-95-1	1	IJ+		1		1
erfluorodecanoic acid	335-76-2	N.D.			1		1
erfluoroundecanoic acid	2058-94-8	N.D.			2		1
erfluorododecanoic acid	307-55-1	N.D.			3		1
erfluorotridecanoic acid	72629-94-8	N.D.			2		1
erfluorotetradecanoic acid	376-06-7	N.D.			3		1
erfluorohexanoic acid	307-24-4	9			1		1
erfluoroheptanoic acid	375-85-9	5 T+			1		1
erfluorobutanesulfonate	375-73-5	N.D.			4		1
erfluorohexanesulfonate	355-46-4	7	J		4		1
erfluoro-octanesulfonate	1763-23-1	5	J		5		1
IEtFOSAA	2991-50-6	N.D.			5		1
EtFOSAA is the acronym for	N-ethyl perfluoroc	ctanesul	fonamid	oacetic Ac	id.		
MeFOSAA	2355-31-9	N.D.			4		1
00000000000000000000000000000000000000	modification modification and modificati	modified erfluorooctanoic acid 335-67-1 erfluorononanoic acid 375-95-1 erfluorodecanoic acid 335-76-2 erfluoroundecanoic acid 2058-94-8 erfluorotridecanoic acid 307-55-1 erfluorotridecanoic acid 307-55-1 erfluorotridecanoic acid 376-06-7 erfluorotetradecanoic acid 375-85-9 erfluorohexanoic acid 375-85-9 erfluorobutanesulfonate 375-73-5 erfluoro-octanesulfonate 355-46-4 erfluoro-octanesulfonate 1763-23-1 ENFOSAA 2991-50-6 ENFOSAA 2991-50-6 ENFOSAA 295-31-9	modified erfluorocotanoic acid 335-67-1 35 erfluorononanoic acid 375-95-1 1 erfluorodecanoic acid 335-76-2 N.D. erfluoroundecanoic acid 2058-94-8 N.D. erfluorotoridecanoic acid 307-55-1 N.D. erfluorotridecanoic acid 72629-94-8 N.D. erfluorotteradecanoic acid 376-06-7 N.D. erfluorotetradecanoic acid 375-85-9 5 J+ erfluorohexanoic acid 375-85-9 5 J+ erfluorobetanoic acid 375-73-5 N.D. erfluorohexanesulfonate 375-73-5 N.D. erfluoro-octanesulfonate 355-46-4 7 erfluoro-octanesulfonate 1763-23-1 5 ERFOSAA 2991-50-6 N.D. ERFOSAA 2991-50-6 N.D. ERFOSAA 2355-31-9 N.D.	modified erfluorocotanoic acid 335-67-1 35 erfluorononanoic acid 375-95-1 1 77+ erfluorodecanoic acid 335-76-2 N.D. erfluoroundecanoic acid 2058-94-8 N.D. erfluorododecanoic acid 307-55-1 N.D. erfluorotridecanoic acid 72629-94-8 N.D. erfluorotridecanoic acid 72629-94-8 N.D. erfluorotetradecanoic acid 376-06-7 N.D. erfluorotetradecanoic acid 376-85-9 5 7+ erfluorohexanoic acid 375-85-9 5 7+ erfluorobutanesulfonate 375-73-5 N.D. erfluoro-octanesulfonate 355-46-4 7 J erfluoro-octanesulfonate 1763-23-1 5 J ERFOSAA 2991-50-6 N.D. ERFOSAA 2991-50-6 N.D. ERFOSAA 1s the acronym for N-ethyl perfluorocotanesulfonamide MEFOSAA 2355-31-9 N.D.	modified erfluorocotanoic acid 335-67-1 35 erfluorononanoic acid 375-95-1 1 77+ erfluorodecanoic acid 335-76-2 N.D. erfluoroundecanoic acid 2058-94-8 N.D. erfluorododecanoic acid 307-55-1 N.D. erfluorotridecanoic acid 72629-94-8 N.D. erfluorotridecanoic acid 72629-94-8 N.D. erfluorotetradecanoic acid 307-24-4 9 erfluorohexanoic acid 307-24-4 9 erfluorohexanoic acid 375-85-9 5 7+ erfluorobutanesulfonate 375-73-5 N.D. erfluoro-octanesulfonate 355-46-4 7 J erfluoro-octanesulfonate 1763-23-1 5 J ERFOSAA 2991-50-6 N.D. ERFOSAA 2991-50-6 N.D. ERFOSAA 1s the acronym for N-ethyl perfluorocotanesulfonamidoacetic Active Serious Active Se	modified erfluorocotanoic acid 335-67-1 35 1 erfluorononanoic acid 375-95-1 1 7 1 erfluorodecanoic acid 335-76-2 N.D. 1 erfluoroundecanoic acid 2058-94-8 N.D. 2 erfluorotridecanoic acid 307-55-1 N.D. 3 erfluorotridecanoic acid 72629-94-8 N.D. 2 erfluorotetradecanoic acid 376-06-7 N.D. 3 erfluorohexanoic acid 307-24-4 9 1 erfluorohexanoic acid 375-85-9 5 5 erfluorobutanesulfonate 375-73-5 N.D. 4 erfluoro-octanesulfonate 355-46-4 7 J 4 erfluoro-octanesulfonate 1763-23-1 5 J 5 EtFOSAA 2991-50-6 N.D. 5	modified erfluorocotanoic acid 335-67-1 35 1 erfluorononanoic acid 375-95-1 1 77+ 1 erfluorodecanoic acid 335-76-2 N.D. 1 erfluoroundecanoic acid 2058-94-8 N.D. 2 erfluorododecanoic acid 307-55-1 N.D. 3 erfluorotridecanoic acid 72629-94-8 N.D. 2 erfluorotetradecanoic acid 376-06-7 N.D. 3 erfluorotexancic acid 307-24-4 9 1 erfluorohexanoic acid 375-85-9 5 5 erfluorobutanesulfonate 375-73-5 N.D. 4 erfluoro-cotanesulfonate 355-46-4 7 J 4 erfluoro-cotanesulfonate 1763-23-1 5 5 EFFOSAA 2991-50-6 N.D. 5 MEFOSAA 2991-50-6 N.D. 4

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 07:25	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: P-5U (UPA) Grab Groundwater

Delaware Sand & Gravel

LL Sample # WW 8635724

LL Group # 1718979

Account

05667

Project Name: DE Sand and Gravel Superfund Site

Collected: 10/07/2016 15:05

by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/07/2016 18:05 Reported: 10/26/2016 15:09

SDG#: DSG03-16 DSG5U

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	76	1	1
10954	Perfluorononanoic acid	375-95-1	8	1	1
10954	Perfluorodecanoic acid	335-76-2	4	1	1
10954	Perfluoroundecanoic acid	2058-94-8	5	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	46	1	1
10954	Perfluoroheptanoic acid	375-85-9	23	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NELFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-6	ethyl perfluoroo	ctanesulfonamidoacetic Ac	eid.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesulfonamidoacetic P	Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16288004	10/21/2016 07:42	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16288004	10/17/2016 12:10	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW_101016 Water

LL Sample # WW 8646237

LL Group # 1721593 # 05667 Account

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated

Collected: 10/10/2016

200 Century Parkway

Suite C

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

Mt. Laurel NJ 08054

TBGW-SDG#: DSG05-01TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection	Limit	Dilution Factor	
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l			
	modifi	ed						
10954	Perfluorooctanoic acid	335-67-1	N.D.		1		1	
10954	Perfluorononanoic acid	375-95-1	N.D.		1		1	
10954	Perfluorodecanoic acid	335-76-2	N.D.		1		1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2		1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic acid	307-24-4	N.D.		1		1	
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1		1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4		1	
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4		1	
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5		1	
10954	NETFOSAA	2991-50-6	N.D.		5		1	
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfor	namidoacetic	Acid.			
10954	NMeFOSAA	2355-31-9	N.D.		4		1	
	NMeFOSAA is the acronym for	N-methyl perfluor	octanesulfo	onamidoaceti	c Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1 modified	.1	1	16293009	10/28/2016 05:49	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1 modified	1.1	1	16293009	10/20/2016 14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FDGW 101016 Grab Groundwater

LL Sample # WW 8646238 LL Group # 1721593 Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated

200 Century Parkway Suite C

Mt. Laurel NJ 08054

Collected: 10/10/2016 by CD

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

FDGW-SDG#: DSG05-02FD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	160	1	1
10954	Perfluorononanoic acid	375-95-1	5 J+	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	44	1	1
10954	Perfluoroheptanoic acid	375-85-9	29	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	7 J	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	9 J	5	1
10954	NEtFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	tanesulfonamidoacetic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacetic Acid		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016	06:05	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16293009	10/20/2016	14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: DGC-5 Grab Groundwater

LL Sample # WW 8646239

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

•

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

Collected: 10/10/2016 12:05

DGC5- SDG#: DSG05-03

No.	Analysis Name	CAS Number	Result			Method Detection Limi	Dilution t Factor
Misc.	Organics EPA	537 Rev. 1.1	ng/l			ng/l	
	mod	ified					
10954	Perfluorooctanoic acid	335-67-1	190			1	1
10954	Perfluorononanoic acid	375-95-1	6 J+			1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.			1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.			3	1
10954	Perfluorotridecanoic aci	.d 72629-94-8	N.D.			2	1
10954	Perfluorotetradecanoic a	cid 376-06-7	N.D.			3	1
10954	Perfluorohexanoic acid	307-24-4	55			1	1
10954	Perfluoroheptanoic acid	375-85-9	31 丁 +	-		1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.			4	1
10954	Perfluorohexanesulfonate	355-46-4	7	J		4	1
10954	Perfluoro-octanesulfonat	e 1763-23-1	12			5	1
10954	NETFOSAA	2991-50-6	N.D.			5	1
	NEtFOSAA is the acronym	for N-ethyl perfluoro	octanesuli	fonamid	loaceti	c Acid.	
10954	NMeFOSAA	2355-31-9	N.D.			4	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16293009	10/28/2016	06:22	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	1	16293009	10/20/2016	14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: DDA-07-US Grab Groundwater

LL Sample # WW 8646240 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

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Golder Associates Incorporated

200 Century Parkway

Suite C

Reported: 11/01/2016 10:21 Mt. Laurel NJ 08054

DDA07 SDG#: DSG05-04BKG

Collected: 10/10/2016 12:50

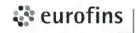
Submitted: 10/14/2016 18:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	150	1	1
10954	Perfluorononanoic acid	375-95-1	9	1	1
10954	Perfluorodecanoic acid	335-76-2	1 J	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	25	1	1
10954	Perfluoroheptanoic acid	375-85-9	16	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	21	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	19	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Acid	d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 03	3:38	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16293009	10/20/2016 14	4:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DDA-07-US MS Grab Groundwater

LL Sample # WW 8646241

1111

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Collected: 10/10/2016 12:50 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

DDA07 SDG#: DSG05-04MS

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	
	modified	1				
10954	Perfluorooctanoic acid	335-67-1	270		1	1
10954	Perfluorononanoic acid	375-95-1	150		1	1
10954	Perfluorodecanoic acid	335-76-2	160		1	1
10954	Perfluoroundecanoic acid	2058-94-8	150		2	1
10954	Perfluorododecanoic acid	307-55-1	180		3	1
10954	Perfluorotridecanoic acid	72629-94-8	160		2	1
10954	Perfluorotetradecanoic acid	376-06-7	170		3	1
10954	Perfluorohexanoic acid	307-24-4	170		1	1
10954	Perfluoroheptanoic acid	375-85-9	150		1	1
10954	Perfluorobutanesulfonate	375-73-5	160		4	1
10954	Perfluorohexanesulfonate	355-46-4	180		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	160		5	1
10954	NEtFOSAA	2991-50-6	150		5	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesulfo	namidoacetio	Acid.	
10954	NMeFOSAA	2355-31-9	190		4	1
	NMeFOSAA is the acronym for N	methyl perfluore	octanesulf	onamidoaceti	ic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16293009	10/28/2016 03:54	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	1	16293009	10/20/2016 14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: DDA-07-US MSD Grab Groundwater

LL Sample # WW 8646242 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Golder Associates Incorporated

200 Century Parkway

Submitted: 10/14/2016 18:35 Suite C

Mt. Laurel NJ 08054

DDA07 SDG#: DSG05-04MSD

Collected: 10/10/2016 12:50

Reported: 11/01/2016 10:21

No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	340	1	1
10954	Perfluorononanoic acid	375-95-1	180	1	1
10954	Perfluorodecanoic acid	335-76-2	170	1	1
10954	Perfluoroundecanoic acid	2058-94-8	190	2	1
10954	Perfluorododecanoic acid	307-55-1	200	3	1
10954	Perfluorotridecanoic acid	72629-94-8	190	2	1
10954	Perfluorotetradecanoic acid	376-06-7	220	3	1
10954	Perfluorohexanoic acid	307-24-4	200	1	1
10954	Perfluoroheptanoic acid	375-85-9	180	1	1
10954	Perfluorobutanesulfonate	375-73-5	180	4	1
10954	Perfluorohexanesulfonate	355-46-4	210	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	200	5	1
10954	NETFOSAA	2991-50-6	190	5	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesulfonamidoacetic Acid	1.	
10954	NMeFOSAA	2355-31-9	230	4	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacetic Aci	.d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 05	:00 Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16293009	10/20/2016 14	:35 Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW_101016 Grab Water

LL Sample # WW 8646243

LL Group # 1721593

Account

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated

Collected: 10/10/2016 15:20

by CD

200 Century Parkway

Suite C

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Mt. Laurel NJ 08054

FB-GW SDG#: DSG05-05FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection I	Dilution Limit Factor	1
Misc.	Organics EPA	537 Rev. 1.1	ng/l		ng/l		
	mod	ified					
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	1	
10954	Perfluorononanoic acid	375-95-1	N.D.		1	1	
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1	
10954	Perfluorotridecanoic aci	d 72629-94-8	N.D.		2	Kabantana 1 Japan.	
10954	Perfluorotetradecanoic a	cid 376-06-7	N.D.		3	1	
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	1	
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	1	
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	1	
10954	Perfluoro-octanesulfonat	e 1763-23-1	N.D.		5	1	
10954	NETFOSAA	2991-50-6	N.D.		5	1	
	NEtFOSAA is the acronym	for N-ethyl perfluore	octanesulfor	namidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	N.D.		4	1	
	NMeFOSAA is the acronym	for N-methyl perfluor	cooctanesulf	onamidoaceti	c Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016	06:38	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16293009	10/20/2016	14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DGC-7S Grab Groundwater

LL Sample # WW 8646244 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Collected: 10/10/2016 16:05 by CD

Golder Associates Incorporated

200 Century Parkway

Submitted: 10/14/2016 18:35

Suite C

Reported: 11/01/2016 10:21

Mt. Laurel NJ 08054

DGC7S SDG#: DSG05-06

CAT No.	Analysis Name	CAS Number	Result	:	Method Detection Limit	Dilution Factor					
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l						
	modified										
10954	Perfluorooctanoic acid	335-67-1	130		1	1					
10954	Perfluorononanoic acid	375-95-1	10		1	1					
10954	Perfluorodecanoic acid	335-76-2	1	J	1	1					
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	1					
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1					
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	1					
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	1					
10954	Perfluorohexanoic acid	307-24-4	23		1	1					
10954	Perfluoroheptanoic acid	375-85-9	16		1	1					
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	1					
10954	Perfluorohexanesulfonate	355-46-4	9	J	4	1					
10954	Perfluoro-octanesulfonate	1763-23-1	15		5	1					
10954	NETFOSAA	2991-50-6	N.D.		5	1					
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesu.	lfonamidoacetic Acid							
10954	NMeFOSAA	2355-31-9	N.D.		4	1.					
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.										
NEtF	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.										

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 06	6:55	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16293009	10/20/2016 14	4:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW 101316 Water

LL Sample # WW 8646245

LI

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

rioject Name: Di band and Graver buperrand bro

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Collected: 10/13/2016

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

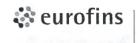
TB-GW SDG#: DSG05-07TB

No.	Analysis Name		CAS Number	Result			Method Detectio	n Limit	Dil Fac	ution tor
Misc.	Organics	EPA 537	Rev. 1.1	ng/l			ng/l			
		modified	l							
10954	Perfluorooctanoic ac	id	335-67-1	N.D.			1		1	
10954	Perfluorononanoic ac	id	375-95-1	N.D.			1		1	
10954	Perfluorodecanoic ac	id	335-76-2	N.D.			1		1	
10954	Perfluoroundecanoic	acid	2058-94-8	N.D.			2		1	
10954	Perfluorododecanoic	acid	307-55-1	N.D.			3		1	
10954	Perfluorotridecanoic	acid	72629-94-B	N.D.			2		1	
10954	Perfluorotetradecano	ic acid	376-06-7	N.D.			3		1	
10954	Perfluorohexanoic ac	id	307-24-4	N.D.			1		1	
10954	Perfluoroheptanoic a	cid	375-85-9	N.D.			1		1	
10954	Perfluorobutanesulfo	nate	375-73-5	N.D.			4		1	
10954	Perfluorohexanesulfo	nate	355-46-4	N.D.			4		1	
10954	Perfluoro-octanesulf	onate	1763-23-1	N.D.			5		1	
10954	NETFOSAA		2991-50-6	N.D.			5		1	
	NEtFOSAA is the acro	nym for N-	ethyl perfluoro	octanesulfor	namidoaceti	c Acid.				
10954	NMeFOSAA		2355-31-9	N.D.			4		1	
	NMeFOSAA is the acro	nym for N-	methyl perfluoro	octanesulfo	onamidoacet	ic Acid				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev modified	r. 1.1	1	16295004	10/28/2016 1	2:55	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev	r. 1.1	1	16295004	10/24/2016 1	0:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW_101316 Grab Water

LL Sample # WW 8646246

Project Name: DE Sand and Gravel Superfund Site

LL Group # 1721593 Account # 05667

Collected: 10/13/2016 10:55 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

SDG#: DSG05-08FB FB--G

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid	ì.	
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Ac	id.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016 13:12	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16295004	10/24/2016 10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FDGW 101316 Grab Groundwater

LL Sample # WW 8646247 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

LL Group # 1721593 Account # 05667

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Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Collected: 10/13/2016 by CD

FD-GW SDG#: DSG05-09FD

CAT No.	Analysis Name	CAS Number	Result			Method Detection	Limit	Dilution Factor
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l			ng/l		
	modif	ied						
10954	Perfluorooctanoic acid	335-67-1	86			1		1
10954	Perfluorononanoic acid	375-95-1	10			1		1
10954	Perfluorodecanoic acid	335-76-2	2			1		1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2		1
10954	Perfluorododecanoic acid	307-55-1	N.D.			3		1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.			2		1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.			3		1
10954	Perfluorohexanoic acid	307-24-4	29			1		1
10954	Perfluoroheptanoic acid	375-85-9	16			1		1
10954	Perfluorobutanesulfonate	375-73-5	N.D.			4		1
10954	Perfluorohexanesulfonate	355-46-4	10	_s T		4		1
10954	Perfluoro-octanesulfonate	1763-23-1	11			5		1
10954	NETFOSAA	2991-50-6	N.D.			5		1
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesul	fonam	idoaceti	ic Acid.		
10954	NMeFOSAA	2355-31-9	N.D.			4		1
	NMeFOSAA is the acronym for	N-methyl perfluor	ooctanesu	lfona	midoacet	tic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rem modified	7. 1.1	1	16295004	10/28/2016	13:28	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev	7. 1.1	1	16295004	10/24/2016	10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: AWC-E1 (132) Grab Groundwater

LL Sample # WW 8646248 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

rioject name. Di sand and Graver superrund site

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

AWC12 SDG#: DSG05-10

Collected: 10/13/2016 10:50

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	84		1	1
10954	Perfluorononanoic acid	375-95-1	10		1	1
10954	Perfluorodecanoic acid	335-76-2	3		1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	1
10954	Perfluorohexanoic acid	307-24-4	29		1	1
10954	Perfluoroheptanoic acid	375-85-9	16		1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	1
10954	Perfluorohexanesulfonate	355-46-4	9	J	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	10	J	5	1
10954	NEtFOSAA	2991-50-6	N.D.		5	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesul	fonamidoa	acetic Acid.	
10954	NMeFOSAA	2355-31-9	N.D.		4	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesu	lfonamido	pacetic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	:	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016 1	3:44	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16295004	10/24/2016 1	0:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: AWC-E2 (140) Grab Groundwater

LL Sample # WW 8646249

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Collected: 10/13/2016 11:25

AWC14 SDG#: DSG05-11BKG

CAT No.	Analysis Name	CAS Number	Result		Method Detection	Limit	Dilution Factor	and Drink
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l		ng/l			
	modif:	ied						
10954	Perfluorooctanoic acid	335-67-1	110		1		1	
10954	Perfluorononanoic acid	375-95-1	6		1		1	
10954	Perfluorodecanoic acid	335-76-2	3		1		1	
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2		1	
10954	Perfluorododecanoic acid	307-55-1	N.D.		3		1	
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2		1	
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3		1	
10954	Perfluorohexanoic acid	307-24-4	30		1		1	
10954	Perfluoroheptanoic acid	375-85-9	12		1		1	
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4		1	
10954	Perfluorohexanesulfonate	355-46-4	30		4		1	
10954	Perfluoro-octanesulfonate	1763-23-1	14		5		1	
10954	NETFOSAA	2991-50-6	N.D.		5		1	
	NEtFOSAA is the acronym for	N-ethyl perfluoro	ctanesulfor	namidoaceti	c Acid.			
10954	NMeFOSAA	2355-31-9	N.D.		4		1	
	NMeFOSAA is the acronym for	N-methyl perfluore	octanesulf	namidoacet	ic Acid.			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. modified	1.1	1	16295004	10/28/2016	10:44	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. modified	1.1	1	16295004	10/24/2016	10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: AWC-E2 (140) MS Grab Groundwater

LL Sample # WW 8646250

Project Name: DE Sand and Gravel Superfund Site

LL Group # 1721593 Account # 05667

Collected: 10/13/2016 11:25 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

AWCE2 SDG#: DSG05-11MS

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	290	1	1
10954	Perfluorononanoic acid	375-95-1	170	1	1
10954	Perfluorodecanoic acid	335-76-2	170	1	1
10954	Perfluoroundecanoic acid	2058-94-8	160	2	1
10954	Perfluorododecanoic acid	307-55-1	190	3	1
10954	Perfluorotridecanoic acid	72629-94-8	170	2	1
10954	Perfluorotetradecanoic acid	376-06-7	170	3	1
10954	Perfluorohexanoic acid	307-24-4	200	1	1
10954	Perfluoroheptanoic acid	375-85-9	180	1	1
10954	Perfluorobutanesulfonate	375-73-5	160	4	1
10954	Perfluorohexanesulfonate	355-46-4	210	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	180	5	1
10954	NETFOSAA	2991-50-6	160	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	220	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Acid	i.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Cample	Analszaia	Pagord
Laboratory	Sample	Analysis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016 11:01	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16295004	10/24/2016 10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: AWC-E2 (140) MSD Grab Groundwater

LL Sample # WW 8646251

LL Group # 1721593

Account

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated 200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Collected: 10/13/2016 11:25

Submitted: 10/14/2016 18:35

Reported: 11/01/2016 10:21

AWC4-SDG#: DSG05-11MSD

No.	Analysis Name	CAS Number	Result		Method Detection Lim	Dilution it Factor
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	
	modifi	ed				
10954	Perfluorooctanoic acid	335-67-1	280		1	1
10954	Perfluorononanoic acid	375-95-1	160		1	1
10954	Perfluorodecanoic acid	335-76-2	180		1	1
10954	Perfluoroundecanoic acid	2058-94-8	190		2	1
10954	Perfluorododecanoic acid	307-55-1	190		3	1
10954	Perfluorotridecanoic acid	72629-94-8	160		2	1
10954	Perfluorotetradecanoic acid	376-06-7	160		3	1
10954	Perfluorohexanoic acid	307-24-4	220		1	1
10954	Perfluoroheptanoic acid	375-85-9	160		1	1
10954	Perfluorobutanesulfonate	375-73-5	150		4	THE TAX A STREET AND A STREET
10954	Perfluorohexanesulfonate	355-46-4	210		4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10954	Perfluoro-octanesulfonate	1763-23-1	180		5	1
10954	NETFOSAA	2991-50-6	170		5	1
	NEtFOSAA is the acronym for	N-ethyl perfluoro	octanesulfo	namidoacetic	Acid.	
10954	NMeFOSAA	2355-31-9	230		4	1
	NMeFOSAA is the acronym for	N-methyl perfluor	octanesulf	onamidoaceti	c Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016	12:06	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16295004	10/24/2016	10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: AWC-E1 (156) Grab Groundwater

LL Sample # WW 8646252 LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Collected: 10/13/2016 11:50 by CD

Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

AWCE1 SDG#: DSG05-12

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	76	1	1
10954	Perfluorononanoic acid	375-95-1	12 丁十	1	1
10954	Perfluorodecanoic acid	335-76-2	4	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	30	1	1
10954	Perfluoroheptanoic acid	375-85-9	15 J+	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	8 J	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	11	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	hyl perfluoroo	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesulfonamidoacetic Aci	d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analyzie	Pecord
Haboratory	Sample	AHALYSIS	Kecord

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016 14:01	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16295004	10/24/2016 10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: AWC-K1 Grab Groundwater

LL Sample # WW 8646253

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Golder Associates Incorporated

200 Century Parkway

Suite C

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Collected: 10/13/2016 13:00

Mt. Laurel NJ 08054

AWCK1 SDG#: DSG05-13

CAT No.	Analysis Name	CAS Number	Resul			Method Detection L	imit	Dilution Factor
Misc.	Organics EPA 5	37 Rev. 1.1	ng/l			ng/l		
	modif	ied						
10954	Perfluorooctanoic acid	335-67-1	23			1		1
10954	Perfluorononanoic acid	375-95-1	2	1 J+		1		1
10954	Perfluorodecanoic acid	335-76-2	N.D.			1		1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2		1
10954	Perfluorododecanoic acid	307-55-1	N.D.			3		1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.			2		1
10954	Perfluorotetradecanoic aci	d 376-06-7	N.D.			3		1
10954	Perfluorohexanoic acid	307-24-4	7			1		1
10954	Perfluoroheptanoic acid	375-85-9	4 J+			1		1
10954	Perfluorobutanesulfonate	375-73-5	N.D.			4		1
10954	Perfluorohexanesulfonate	355-46-4	6	J		4		1
10954	Perfluoro-octanesulfonate	1763-23-1	6	J		5		1
10954	NETFOSAA	2991-50-6	N.D.			5		1
	NEtFOSAA is the acronym fo	r N-ethyl perfluorod	octanesul	lfonamid	oaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	N.D.			4		1
	NMeFOSAA is the acronym fo	r N-methyl perfluoro	octanesi	lfonami	doacet	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	138 -	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016 1	4:34	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16295004	10/24/2016 1	0:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by CD

Sample Description: AWC-E2 (165) Grab Groundwater

LL Sample # WW 8646254

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account # 05667

Golder Associates Incorporated

200 Century Parkway

Suite C

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Collected: 10/13/2016 13:05

Mt. Laurel NJ 08054

AWC2-SDG#: DSG05-14

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	130	1	1
10954	Perfluorononanoic acid	375-95-1	5	1	1
10954	Perfluorodecanoic acid	335-76-2	3	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D. V	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D. U 5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D. UJ	3	1
10954	Perfluorohexanoic acid	307-24-4	33	1	1
10954	Perfluoroheptanoic acid	375-85-9	15	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	26	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	15	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	tanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesulfonamidoacetic Aci	d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analveie	Record
Laboratory	pampre	WIIGTARIR	Kecord

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16295004	10/28/2016	14:50	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16295004	10/24/2016	10:00	Robert Brown	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TBGW 101416 Water

LL Sample # WW 8646255

Project Name: DE Sand and Gravel Superfund Site

LL Group # 1721593 Account # 05667

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Golder Associates Incorporated

200 Century Parkway

Suite C

Mt. Laurel NJ 08054

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

T--GW SDG#: DSG05-15TB

Collected: 10/14/2016

No.	Analysis Name	CAS Number	Result		Method Detection Limi	Dilution t Factor
Misc.	Organics EPA	537 Rev. 1.1	ng/l		ng/l	
	modi:	fied				
10954	Perfluorooctanoic acid	335-67-1	N.D.		1	1
10954	Perfluorononanoic acid	375-95-1	N.D.		1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	1
10954	Perfluorotetradecanoic aci	id 376-06-7	N.D.		3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		5	1
10954	NETFOSAA	2991-50-6	N.D.		5	1
	NEtFOSAA is the acronym fo	or N-ethyl perfluoro	octanesulfor	amidoaceti	c Acid.	
10954	NMeFOSAA	2355-31-9	N.D.		4	1
	NMeFOSAA is the acronym fo	or N-methyl perfluore	octanesulfo	namidoacet	ic Acid.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 08:00	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16293009	10/20/2016 14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: FBGW_101416 Grab Water

LL Sample # WW 8646256

LL Group # 1721593

Project Name: DE Sand and Gravel Superfund Site

Account

05667

Collected: 10/14/2016 10:45

by CD

200 Century Parkway

Golder Associates Incorporated

Submitted: 10/14/2016 18:35

Suite C

Reported: 11/01/2016 10:21

Mt. Laurel NJ 08054

SDG#: DSG05-16FB F--GW

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l	ng/l	
	modified				
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	1
10954	NETFOSAA	2991-50-6	N.D.	5	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesulfonamidoacetic Acid		
10954	NMeFOSAA	2355-31-9	N.D.	4	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanesulfonamidoacetic Aci	d.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	\mathtt{Sample}	Analysis	Record
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CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 08:17	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16293009	10/20/2016 14:35	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: P-4 (UPA) Grab Groundwater

LL Sample # WW 8646257 LL Group # 1721593

Account # 05667

Project Name: DE Sand and Gravel Superfund Site

Golder Associates Incorporated

Collected: 10/14/2016 11:10 by CD

200 Century Parkway

Suite C

Submitted: 10/14/2016 18:35 Reported: 11/01/2016 10:21

Mt. Laurel NJ 08054

P-4UP SDG#: DSG05-17

No.	Analysis Name	CAS Number	Result			Method Detection Limit	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l			ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	170			1	1
10954	Perfluorononanoic acid	375-95-1	68			1	1
10954	Perfluorodecanoic acid	335-76-2	1	J		1	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.			2	1
10954	Perfluorododecanoic acid	307-55-1	N.D.			3	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.			2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.			3	1
10954	Perfluorohexanoic acid	307-24-4	86			1	1
10954	Perfluoroheptanoic acid	375-85-9	33			1	1
10954	Perfluorobutanesulfonate	375-73-5	29			4	1
10954	Perfluorohexanesulfonate	355-46-4	190			4	1
10954	Perfluoro-octanesulfonate	1763-23-1	28			5	1
10954	NETFOSAA	2991-50-6	N.D.			5	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesulf	onamid	oacetic Acid	1.	
10954	NMeFOSAA	2355-31-9	N.D.			4	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanesul	fonamio	doacetic Aci	id.	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	e	Analyst	Dilution Factor
10954	PFCs (10) EPA 537	EPA 537 Rev. 1.1 modified	1	16293009	10/28/2016 0	08:33	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16293009	10/20/2016 1	L4:35	Devon M Whooley	1